Pit and Quarry

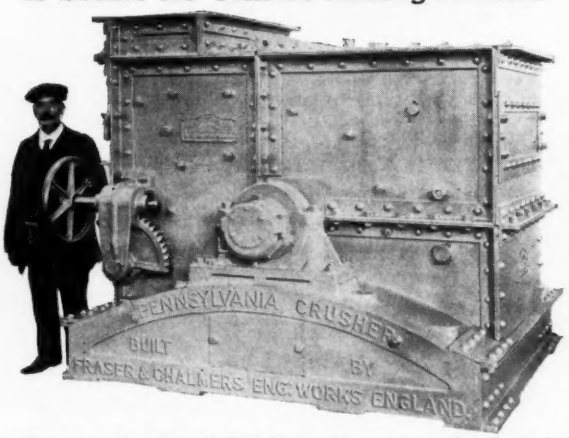
SAND ▪ GRAVEL ▪ STONE

HANDLING ▪ CRUSHING ▪ SCREENING ▪ WASHING

"PENNSYLVANIA" STEELBUILT CRUSHER

Selected by BUNDI ENGINEERS to Secure for Cement Making in India

the benefits of the best Hammermill Practice adopted by leading American and Canadian Cement Manufacturers.



Unfailing STEEL Construction

Adjustable Steel Cage

Automatic Tramp Iron Separator

Lowest Operating Costs

Built at Erith, England, for Bundi Portland Cement Co., Bombay, India, by Fraser & Chalmers Engineering Works, associated with Pennsylvania Crusher Company.

Put Your Reduction Problems Up to Us.

General Offices
Stephen Girard Bldg.
PHILADELPHIA

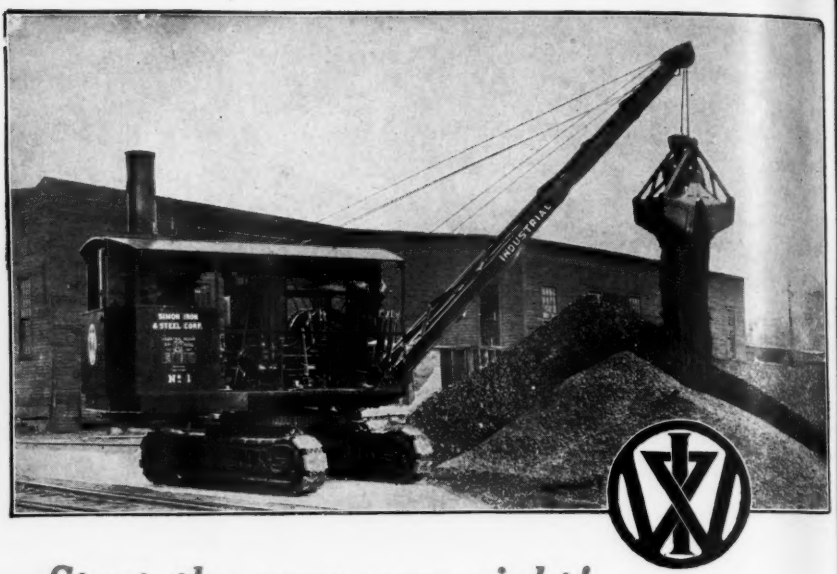
PENNSYLVANIA CRUSHER COMPANY

Branch Offices
New York Pittsburgh Chicago
Salt Lake City London Calcutta

January 1, 1925

Index to Advertisers - - - - - Page 63
Table of Contents - - - - - - - Page 65

Circulation 7,700



Start the new year right!

THE INDUSTRIAL Works offers to modern industry another engineering achievement—a sturdy 10-ton crawling tractor locomotive crane. Like all INDUSTRIAL cranes, this new type D excells in its class by out-standing superiority in design, construction, power, speed, endurance and general utility. The requirements of all classes of industry and the universal demand for a better-built crane of moderate capacity are now fulfilled.

The type D is built for either steam, electric, or gasoline power and is mounted on crawling tractor belts, wide gauge traction wheels or standard railway trucks of four or eight wheels. It may be used interchangeably with a clamshell bucket, electric-magnet, hook and block, dipper-arm shovel, dragline, or pile driver leaders.

It is designed and executed from tread to boom tip in one plant by America's pioneer crane builders. Fifty years of highly specialized engineering experience and business integrity constitute the guarantee back of this newest INDUSTRIAL achievement.

A 16-page booklet fully describing and illustrating the type D crawling tractor crane will be sent immediately upon request.

INDUSTRIAL WORKS
BAY CITY - MICHIGAN
Locomotive Cranes, 5 to 200 Tons -- Transfer, Pillar & Gantry Cranes
Railway Pile Drivers -- Combination Crane Pile Drivers -- Transfer Tables
Portable Rail Saws -- Grab Buckets -- Magnets -- Steam Pile Hammers

INDUSTRIAL
CRAWLING TRACTOR CRANES

Pit and Quarry

A Semi-Monthly Publication for Producers and Manufacturers of Sand, Gravel, Stone, Cement, Gypsum, Lime and Other Non-Metallic Minerals.

VOL. 9 CHICAGO, ILL., JANUARY 1, 1925 NO. 7

CONTENTS

Cincinnati 67
Chicago 68
Terre Haute Gravel Company Operating Fifth Plant... 69
The W. M. A. A. Annual Meeting and Banquet..... 72
Business Interruption Insurance..... 73
Memphis Company Builds Where Old Disappeared.... 77
The N. S. G. A. Convention Program..... 82
Balance Sheet Organization..... 87
Recent Patents 90
The M. V. S. G. A. Convention..... 90
City of Winnipeg Operating Large Quarry Department 91
New Incorporations 94
The Yanks Made Their Own Cement..... 95
A Small But Modern Sand and Gravel Plant..... 97
The N. C. S. A. Convention Program.....100
The Economics of Rate Making.....101
The Mid Winter Season At Pittsburgh.....110
Vermont Corporation Operating Marble Deposit.....111
Exhibitors at Crushed Stone Convention.....113
The A. R. B. A. Convention Program.....116
The Eaton Kaster Gravel Company Modernize Plant...117
Cement People Take a Rest.....119
Political Improvement Helps Situation.....121
Ship Early Slogan for 1925.....123
Outstanding Link Belt 1924 Achievements.....125
Trade Notes, Catalogs, New Equipment.....126-128

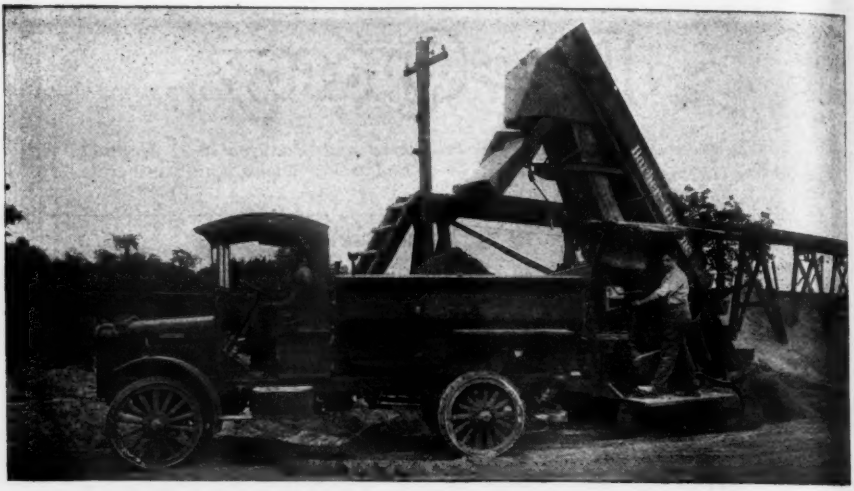
COMPLETE SERVICE PUBLISHING CO.
Rand-McNally Bldg., Chicago, Ill.

Publishers of
PIT AND QUARRY and Pit and Quarry HANDBOOK

HARRY W. BAUMGARTNER
President
W. A. WILSON
Advertising Manager
S. E. COLE, Eastern Representative
90 West Street, New York
Ph. Rector 4154

HAROLD W. MUNDAY
Editor

Associate Editors
ROBERT N. RISSER
GEORGE B. MASSEY



150% Increase in Speed 80% Decrease in Costs

South & Caven, Inc., Philadelphia, have this to say about their Barber-Greene: "Our experience has been that this loader is a great time and labor saver, and if it could not be replaced we would not sell it at any price."

The fact that their Barber-Greene has increased material handling speed 150% and has reduced loading costs at least 80% constitutes the basis for this statement.

This particular Barber-Greene is used on South & Caven's Disston Street Wharf to load sand pebbles and gravel into trucks and wagons. It loads an average of fifteen 3- to 10-ton trucks and eight wagons per hour.

The Barber-Greene operator constitutes the entire loading crew, replacing the three men that were necessary with the electric power loader formerly used for this work. In addition, the exceptional mobility of the Barber-Greene permits it to perform numerous odd jobs when it is not needed at the wharf. Trimming storage piles, doing light grading, and even handling cut and fill work, are some of its outside duties.

Its operating and expense records correspond with those of other Barber-Greene owners. Gasoline consumption is from seven to ten gallons for days of eight to eleven working hours.

During six months of continuous service not a single cent has been spent on this machine for repairs. Our Catalog N will show you Barber-Greene equipment that can reduce considerably your material-handling costs and at the same time speed up your work. Send for a copy.

BARBER-GREENE COMPANY, 490 West Park Ave., Aurora, Ill.

Representatives in fifty cities

BARBER GREENE

Portable Belt Conveyors Self Feeding Bucket Loaders

Coal Loaders . . Automatic Ditch Diggers . . Coal Feeders

Pit and Quarry

Vol. 9 Chicago, Ill., January 1, 1925 No. 7

Cincinnati

CINCINNATI is located in the southwestern corner of the State of Ohio on the north bank of the Ohio River midway between its mouth at Cairo, Illinois and its source at Pittsburgh. It is sometimes referred to as the most southern northern city and the most northern southern city in the United States. It has an area of about 72 square miles extending about 12 miles along the Ohio River.

There are many reasons why Cincinnati is advantageous to manufacturers. It is located near to the sources of various raw materials; it is abundantly supplied with skilled labor; and it has excellent transportation facilities both by rail and by water. Unlimited quantities of coal, iron and lumber of the highest grade are produced within easy transportation distance. There are more than 3,000 manufacturing establishments in Cincinnati. These employ a hundred thousand operatives and have an annual output of a figure between nine hundred million and a billion dollars. The export trade is so great that this city ranks among the first five centers of America recognized by foreign buyers. Among the products exported the most prominent are machine tools, soaps and vehicles.

Cincinnati can boast of leading the world in the manufacture of machine tools, woodworking machinery, soap, playing cards, and laundry machinery; it has few rivals in the production of office furniture, ladies' shoes, men's clothing, ladies' suits and cloaks, electrical tools, metal goods, adding machines, pianos, chemicals, fertilizer, and other products.

Cincinnati is an important railway center being called the gateway to the south. The lines to the southern states east of the Mississippi are the Southern Railway, the Louisville and Nashville, and the Illinois Central. Other lines radiating in all directions out of Cincinnati are the Chesapeake and Ohio, Norfolk and Western, Baltimore and Ohio, Pennsylvania, Erie, Big Four, and Cincinnati, Indianapolis and Western. The city owns a railroad, having built the Cincinnati Southern Railway which extends from Cincinnati to Chattanooga and is operated as part of the Southern Railway System.

Cincinnati has its own municipal university which is a part of its public school system. The city has given a great deal of attention to cultural development. It ranks as one of the distinctive musical centers of the country with its Cincinnati Symphony Orchestra and its May Festivals. A $4,000,000 hospital in connection with its Medical College testifies to its interest in progress.

Cincinnati is interested in the development of its river traffic and has regular service to all river points as far east as Pittsburgh and to Louisville. The service to New Orleans is rapidly improving. The construction of river and rail transfer terminals is greatly facilitating river traffic.

The trading area of the city extends for a radius of 30 miles on the north and east, 50 miles on the west and 90 miles on the south. More than 75 per cent of the population of the country live within eight hundred miles of Cincinnati. The population living within 600 miles of the city is 63,000,000.

There are many points of interest in the city some of which are the Arts Museum and Art School, The University of Cincinnati, Hamilton County Memorial Hall, the Post Office, the Public Library, and the Sterling Glass Works. Two of the popular hotels are the Gibson and the Sinton.

Chicago

CHICAGO is in many ways an ideal convention city. It can offer its guests almost unlimited resources in the way of entertainment. Its hotels are unsurpassed in conveniences and luxuries; its railroad connections serve the entire country adequately.

Chicago's expansion and improvement have been almost phenominal. According to the 1923 census the population is 2,886,121. The city covers an area of 201.28 square miles. It extends 26 miles north and south and 9 miles east and west. There are 84 miles of boulevards and 5,059,682 miles of streets and alleys. The actual value of real estate and personal property, according to figures compiled in 1922, is $3,363,883,016. The value of its manufactured products in 1919 was $3,658,740,000. It is the world's livestock, grain and lumber market. It leads in the distribution of dry goods, general merchandise, food stuffs, seeds, machinery, jewelry, pianos, wearing apparel, automobiles, furniture and household requisites.

Improvements in the city are under the guidance of the Chicago Plan Commission which was created by the city council November 1, 1909. Its membership of 328 consists of the mayor, the heads of the various city departments, chairmen of council committees, chiefs of various governmental bodies and the entire city council (ex officio) with the remainder of the personnel composed of citizens from every interest in the city's municipal life. This Commission is planning the widening, extending and improving of 200 miles of streets; a remodeling of the passenger and freight railroad and terminal facilities; the creation of adequate harbors; the rehabilitation of the transportation system; the park and harbor development along the shore of Lake Michigan; the establishment of an adequate new postoffice; and the creation of a system of approximately 35,000 acres of forest preserves north, west and south of Chicago. Visitors in Chicago will enjoy some of the benefits of the work of this Commission. The Chicago Plan Commission is working in harmony with every organization in Chicago. It gives illustrated lectures before clubs, societies, etc., and upon application at its headquarters literature can be secured covering the various features of its work in endeavoring to make Chicago the best, most orderly, healthful, convenient and attractive city in America.

An interesting feature of Chicago, overlooked by many visitors, is its tunnel system. Underlying nearly all of the streets in the central business section are 60 miles of tunnels connecting the freight terminals of the railroads with commercial houses. The tunnels are provided with narrow gauge electric railroads equipped with electric locomotives and steel cars. These are used chiefly in transporting goods to and from railroad freight yards and in carrying coal to business houses. Excavated and waste material from new buildings is also removed through the tunnels. These tunnels are 33 feet below the street level. The trunk line tunnels are limited in size to 12 feet 9 inches in width and 14 feet in height. The smaller tunnels are limited to 6 feet in width and 7 feet 6 inches in height. The entire tunnel system was put into operation on September 1, 1907.

Another interesting fact is that Chicago has 50 bridges with movable spans and 34 with fixed spans. There are also 48 viaducts. Most of the movable bridges are operated by electricity. The traffic over the Michigan boulevard link bridge was carefully checked up on August 11, 1923. It was found that 53,014 vehicles crossed the bridge between 7 a. m. and 12 midnight, an average of 3,118 an hour, with a maximum of 4,360 during the rush hour, 5:15 to 6:15 p. m.

The principal points of interest in Chicago are as follows: Historical Society library and collection; Lincoln Park conservatory and zoo; Newberry library; Northwestern University; Waterworks; Wrigley building; Art Institute; Board of Trade; Field Museum; Grand Army hall in public library; Jackson Park; Marshall Field & Company's retail store; Grant Park stadium; Stockyards; University of Chicago; Douglas Park; Garfield Park; Humboldt Park.

The principal hotels include the following: Auditorium; Blackstone; Congress; Drake; Great Northern; Sherman; LaSalle; Morrison; and Palmer House.

The Terre Haute Gravel Company Operating Fifth Plant

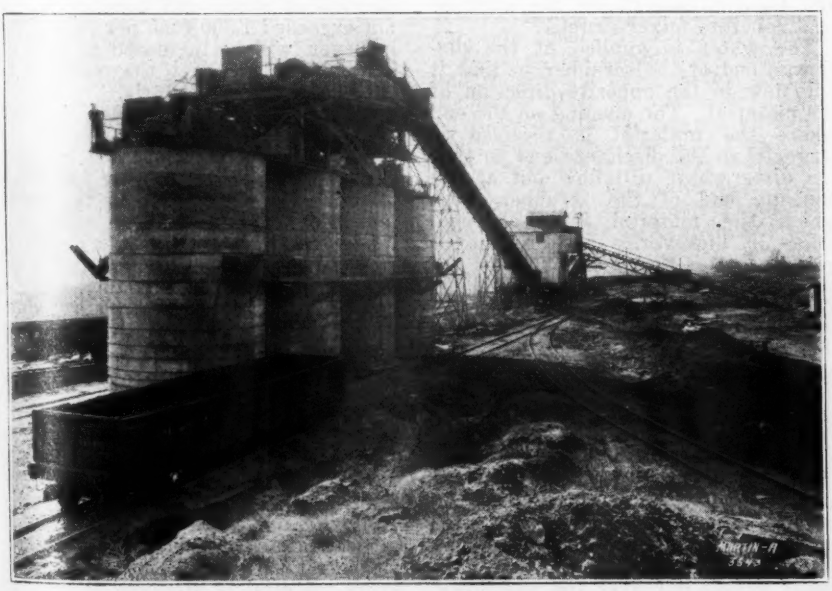
New Terre Haute Plant with Daily Capacity of 3000 Tons. Property Divided by Ravine Into Two Separate Deposits

THE Terre Haute Gravel Company of Terre Haute, Indiana, has completed its new plant "E," which is the fifth plant constructed by the company during its existence of more than twenty years. This new plant is located on what is known as the South Branch of the Pennsylvania Railroad, on the west bank of the Wabash River, and in the switching district of Terre Haute.

The property, which includes two separate and distinct deposits about a quarter of a mile apart, is divided by a ravine. The deposit, lying adjacent to the plant consists of 80 acres ranging from 12 to 15 feet in depth and tests from 60 to 75 percent gravel split on a one quarter inch screen. The deposit across the creek consists of 65 acres and has an average depth of from 25 to 40 feet. It tests from 35 to 50 percent split on the one quarter inch screen. By working the two deposits together the company is able to avoid to a great extent a surplus of any particular size, with the exception at times of one quarter inch sand.

The plant is constructed of concrete and steel throughout, with the exception of the crusher house which is built of wood. Electric motors drive all the machinery with control push button stops located at convenient points to stop any one unit or group of machines as may be desired.

A Monighan dragline with a two yard bucket is used at one deposit and a Browning 25 ton locomotive crane at the other, for loading material from the bank into standard gauge pit cars with a capacity of 25 cubic yards. These cars are equipped with automatic doors to unload the material into a large steel track hopper with a capacity of 50 cubic yards. Two Davenport locomotives are used for hauling the material from the pit to the plant, and at present four pit cars are being used. Two more cars will be added by next season so that



General View of Terre Haute Plant

each locomotive will be able to bring to the plant three cars to the train instead of two as at present.

The first operation at the plant takes the pit run material out of the steel hopper and conveys it to the crusher house on a 30 inch inclined belt conveyor where the material is split and run into two 48 inch revolving screens with 2 inch perforations. The over-size is run into two number 4 gyratory crushers. The crushed material is again elevated and rescreened.

After the material passes through the screens in the crusher house, if unwashed road gravel is desired, a trap is thrown and this material is run on to a 30 inch conveyor belt and elevated to a height of 15 feet and then spouted directly into railroad cars for shipment. If the material is to be washed, the trap or door is thrown back, and the material run on to another 30 inch conveyor belt and elevated to the top of the washing plant. After the material arrives at the top of the washing plant, it can be sent directly to the scrubbers, or if the material is sufficiently clean so that it does not require scrubbing, it can be diverted from the scrubbers and run directly to the screens from the conveyor belt. The two scrubbers are set side by side. They are 12 feet in length and 6 ft. in diameter, and have mixing blades the same as in a concrete mixer drum.

The water is applied at the discharge end of the scrubber so that it will flow in the opposite direction of the material. The opening on the end where the material is received is larger than the discharge end so that the dirty water will flow out at the opposite end of the scrubber from which the material is discharged. There is, however, a certain amount of dirty water that goes out with the material which cannot be avoided. The dirty water also carries out some sand at times, and in order to save this material, a small settling tank has been installed.

Two inclined revolving screens 20 feet in length and 4 feet in diameter are set side by side with perforations ¼ inch. ⅜ inch, ⅝ inch. 1 inch. and 1½ inch. The separated material after leaving the screens is run by gravity direct to the concrete tanks, except the sand which flows to two dewatering sand boxes where the water passes out over the overflows. The sand is dragged out by a double chain with steel plate flights into an automatic settling tank where clean water is applied and the sand rewashed, after which it drops into the concrete tanks.

The washing machinery is located on top of four twenty foot diameter reinforced concrete storage tanks or milling tanks which are 32 feet in height. The storage above the loading chute has a capacity of 600 tons of sand and gravel. Each tank has four two way loading chutes, two on each side. These chutes are made in the shape of a "Y," and are placed between the tanks so that material can be taken out of two tanks at the same time. In this way it is possible to load either separated sizes or mixed sizes as may be desired. Three of these tanks are divided with partitions so that different grades of material can be run into one tank.

In order to get sufficient water to supply this plant, it was necessary to pipe it from the Wabash River, a distance of 4,000 feet. This water is pumped out of the river into a 15 inch sewer pipe with an 8 inch centrifugal pump having a 15 h.p. motor. The water runs by gravity to a receptacle adjacent to the plant where an 8 inch centrifugal pump forces it to the top of the plant. The capacity of this plant was planned for 3,000 tons per day, but it is still in the developing stage and production has not exceeded 1.800 tons per day. This, however, will be increased as soon as it is possible to get the material to the plant more regularly.

There are two gravity loading tracks running on either side of the plant. The plant is located between the tracks so that there are 1.000 feet of track for empties above the plant, and the same amount of space for loads below the plant. There is storage room below the plant for all grades of material, and by having a double track, it is possible to store material from one track while loading material for shipment on the opposite side of the plant. These tracks are also located below the plant so that when reclaiming stored material the cars can be placed on one track and loaded out of the storage pile with a locomotive crane on the other track. This saves the necessity of switching each car after it is loaded. By being able to store material when there are no orders, or when extra material is produced in making a day's run to avoid shutting down,

a lot of dead time is saved. This also makes it possible to close the plant much earlier at the end of the season and to start later in the spring, and still supply the trade during the time the plant is closed. In discussing this plant Mr. George J. Nattkemper, vice president, has the following to say:

"There are three salient points about this plant which I feel are worthy of consideration to anyone who is interested in producing a first class quality of sand and gravel, but before I mention them, I want to say that if there are any producers who like any part of our outlay and desire to know more about any of it and will write us, we shall be very glad to give them a more detailed description. We have always gone on the theory that co-operation among producers is what is needed, and the more co-operation we have, the more satisfactory material we will produce, and the better off we will be financially. We have secured quite a few ideas from others before building this plant, and we certainly feel that we shall pass along anything that we have accomplished.

"The first of the important features that I desire to mention is the scrubbers. Of course, we realize that the scrubbers are not altogether a new thing. However, we feel that the scrubbers that we have are much better than any that we have seen, as they work perfectly and are mechanically designed. I dare say that there is scarcely a deposit of sand and gravel anywhere that at times will not have more or less dirty material. In a dry bank, for instance, where stripping is removed, there are times when no matter how careful the stripping is handled, there will be more or less soil remaining on the top, and again a great many deposits have strata of dirty material running down through clean material below the stripping. When conditions of this kind arise, instead of slowing up the feed so that the material can be more thoroughly cleaned, all that is necessary is to run it through your scrubbers at full capacity, thereby avoiding dirty material for the market. In our particular case, practically 65 percent of our material is run through scrubbers for the reason that it is more or less dirty when coming from the pit, and contains a coating on the larger particles, especially which the scrubbers do not remove altogether. However, the scrubbing of this material softens up the coating to such an extent that we are able to take it off completely after it reaches the screens.

"This operation is the second that I desire to mention, and one of the three important parts about our plant. We were taking the water that we used for spraying the gravel in the screens from off the main water line, and found that we were only getting from 10 to 15 pounds of pressure on our sprays, so we installed a 5 inch Centrifugal Booster Pump at the head of these screens, and raised the pressure to from 75 to 125 pounds in the spray. The spray runs the entire length of the screen, which consists of a 3 inch pipe with 3 to 4 rows of 3/32 inch holes placed from two to three inches apart. The pipe is set as closely to the material in the screen as possible. This operation now only takes off the coating and cleans the material, but if there should be any balls of clay that happen to get into the screen, the extreme pressure of this spray cuts them up in such fine units that it can scarcely be detected in the material.

"The third feature we desire to mention is that heretofore we have always encountered more or less trouble with keeping our conveyor belts clean, especially when dirty material is handled. We have attempted to use brushes, but with no success. What we now are doing is keeping our belt absolutely clean by running a little spray against the belt just underneath the head pulley, and immediately after the material has been discharged into the hopper on top of the plant, all we use is a 1 inch pipe with holes an inch apart which sets about 4 inches from the belt. Aside from keeping your belt clean, this also keeps your return rollers absolutely clean and in perfect operation. We spout the sand and dirt that we spray off these belts where it can be picked up with a locomotive crane, and run through the plant again at odd times.

"Another feature that we are installing, but have not yet completed, is a spreader at the end of our loading chutes to keep our material from pyramiding in the center of the car which has a tendency to let all the coarser material run to the side and the finer material remain in the center. This spreader will throw the material from one side of the car to the other, and will overcome the

tendency that material has in separating to a great extent after it has reached the car.

"We have used these spreaders at one of our other plants with great success, but the conditions were much more simple to install the spreader than at our new plant. We feel, however, that we shall be able to accomplish our aim without question.

"Mr. John A. Cushman, Terre Haute, Indiana, drew the plans for this plant. Mr. Cushman does not pretend to be an expert on gravel plants, and had had very little experience along this line until drawing the plans for this plant. And this is the reason we employed him. We knew that he knew the engineering work thoroughly and that he would build the plant just as we wanted it, as we have done in the other five plants that we have constructed. We do not mean by this that we are finding fault with firms that are making a business of building plants, but there were certain features that we wanted installed, and certain makes of crushers, screens, etc., that we thought would be best adapted to our business and which we could purchase on the open market to a better advantage than by giving someone the contract to build it complete. We think we did a pretty good job of getting first class material, and that our purchases were scattered over a large scope as the following list will show.

"The conveyor belts were purchased from the Indianapolis Belt and Supply Company, Indianapolis, Indiana, and the Cincinnati Rubber Company, Cincinnati, Ohio. The conveyor carriers were purchased from the Stevens-Adamson Company, Aurora, Illinois; revolving screens and crushers from the Worthington Pump and Machinery Corporation, Milwaukee, Wisconsin; scrubbers from the Chain Belt Company, Milwaukee, Wisconsin; structural steel from the Central States Bridge Company, Indianapolis, Indiana; steel plate work, chutes, conveyor machinery from Freeman-Riff Company, Terre Haute, Indiana; motors from the Kester Electric Company, Terre Haute, Indiana; pumps from the Dravo-Doyle Company, Pittsburgh, Pennsylvania."

Mr. Rudolph Nattkemper is superintendent of this plant. The officers of the Company are: J. R. Connelly, President; George J. Nattkemper, Vice President; Wayne F. Nattkemper, Secretary; Chas. F. Connelly, Treasurer.

The Wisconsin Association Meeting and Banquet

THE sixth annual meeting and banquet of the Wisconsin Mineral Aggregate Association held in Milwaukee at the Pfister Hotel, December 18, 1924, marks a definite stride in the progress of the Association.

Mr. Wilson, Executive Secretary of the Association, presented a report concerning the activities of the Association during 1924 and the more extensive work to be done in 1925. The Association has fought for rigid inspection of all highway and construction materials with very favorable results. During 1924 the members of this Association adopted a standard form of proposal contract which has been put into actual practice. The importance of concrete products and the possibilities of extending the market were stressed with the result that nearly all the plants in the territory of the Association are using screen and cleaned aggregate. There are about 500 concrete products manufacturers in the state of Wisconsin, and the increased demand for screened and clean aggregate has favorably affected the business of the Association members.

The following officers were elected: J. K. Jensen of the Janesville Sand and Gravel Company, President; J. D. Ohrt of the Davis Brothers Stone Company, Vice President; E. E. Gillen of the Waukesha Lime and Stone Company, Secretary-Treasurer; and the following members of the Executive Board; R. C. Brown of the Western Lime and Cement Company, Louis Laun of the Elkhart Sand and Gravel Company, C. R. Nutt of the Moraine Gravel Company and Merrit Deutsche of the Racine Crushed Stone Company.

The banquet held in the Fern Room of the Pfister Hotel in the evening was a great success. The Association had present representatives from many allied industries and the various state departments. Mr. Hotchkiss and Mr. Donahue of the State Highway Department gave short talks. Both officials stated that Wisconsin would adopt a "pay as you go" policy in regard to its highway program in the future. The entertainment features absorbed the main part of the evening. The spirit of fellowship and good feeling evidenced during the banquet will assure the continued growth and success of the Wisconsin Mineral Aggregate Association.

Business Interruption Insurance

Written Expressly for PIT AND QUARRY, by DWIGHT INGRAM*

"YES, the loss was fully covered by insurance."

That sentence is the speech that manufacturers make to newspaper reporters as they stand over the smouldering ruins of a plant that has just been demolished by fire.

But is it true?

Partly it is boastful, of course; the corporation officers want to put the best possible light on the situation, both as a defense of themselves and as a reassurance of their creditors and customers. Partly, too, the statement masks a secret fear that maybe the insurance was not what it ought to have been. In most cases the speech is made before the business man has been able to visualize the blackness of the coming months. All he pictures is the ruins and the insurance policies that will pay for rebuilding the plant.

A small printing plant that I have observed intimately has just been sold under the sheriff's hammer. Eighteen months ago the plant was damaged by fire. "The loss was fully covered by insurance," the president told me. Policies covering the building paid $16,000, and those covering equipment and work in process paid $27,000. These sums, plus the fact that printing machinery can be bought on deferred payments, put the plant in condition in five months, and it has been earning a profit ever since. So the president cannot understand why it went bankrupt. The reason comes from an overlooked, "unimportant" calculation by the auditor that during the five months of shutdown the company incurred rent, taxes, salaries and advertising expenses of $17,000. While the $43,000 of property damage was covered, there was no insurance on this $17.000 item, and since the firm did not have a cash surplus equal to $17,000 it necessarily became insolvent. For this further loss must be met by insurance or surplus if a plant is to continue in business.

Quarries are peculiarly subject to the kind of a loss which this printing establishment suffered. If a plant is destroyed in February and the rebuilding must be done during the producing season, then not only is there the overhead expense to meet without any income, but the profits for an entire year are lost.

The loss resulting from fire consists of two parts. First is the direct destruction of property. If a building burns to the ground, it must be rebuilt. If a machine is damaged by heat or by rust from getting soaked by a hose stream, it must be repaired or replaced. These losses are easy to visualize, and almost every property owner guards against them adequately by insurance. But equally real is the second part of the bill which fire presents—the intangible losses due to the interruption of business. It is not universally known that this second feature can be covered by "use and occupancy" or "business interruption" insurance.

While ordinary fire insurance policies and business interruption policies usually run closely parallel in rate and basis of adjustment, there is no necessary relationship between the two losses. The burning of a boiler house with only a few thousand dollars of property damage might put an entire plant out of operation for three months. Conversely, the destruction of a warehouse, with a large property loss, would not interrupt operations at all. While insurance policies may not take into account perfectly this difference between property destruction and the consequential damage, the distinction certainly shows that business interruption is a real loss and can be estimated accurately.

The basis of "business interruption" insurance is the income of receipts of a plant. Whereas an ordinary fire policy is based on the physical value of buildings and contents, the interruption policy insures the annual gross income minus any expenses that stop during a shutdown.

Taking up first the expenses that are not covered by the interruption policy, we can list the following principal items: (1)ordinary labor. It is obvious that as soon as fire occurs and work ceases the operating crews can be let off. Of course, the same individuals may be kept on the pay roll because they are the best available help for reconstruction. But in such a case their wages should be charged to the cost of rebuilding and the expense taken out of the regular insur-

*Engineer, Morse, Case, Lyman and Hubbard.

ance. Operating labor stops after fire and need not be insured. (2) power is just as purely an operating expense as labor, and does not continue. Other similar items are: (3) heat, (4) supplies, (5) maintenance and repairs. Since these expenses stop and there is a general underwriting principle that there should be no insurance where there is no loss, these features are omitted from coverage under the interruption policy.

The correct definition of interruption insurance is gross receipts less expenses that stop. But frequently it is described as the net profit plus those items of expense that continue after fire. This is a back-handed way of saying about the same thing, and while not as accurate, it may be easier to follow. Some of the important features that are covered under this definition are:

(1) Taxes. Though theoretically a reduced assessment should be made when buildings are destroyed, in practice the property is usually restored before the assessors get around to a revision, and the full taxes must be met on the basis of old values or income.

(2) Indebtedness. Most firms, no matter how big their profits, find it a good plan financially to operate partly on borrowed money. This may be in the form of a mortgage on land and buildings, a loan at the bank or deferred payments on machinery. This system makes capital go farther. But the payment of interest and possibly of principal presupposes a continuous income. When the income is cut off abruptly by fire the payments on indebtedness go on falling due with ruthless regularity, and new money must be found to meet them either through interruption insurance or otherwise.

(3) Rental or rental value. Frequently operations are carried on on leased land or offices are maintained in rented buildings. In such cases, unless provision is made in advance in the lease, rent will go on. And even where property is owned outright, fire means a loss of rental value or interest on the capital so tied up.

(4) Salaries and wages. While the operating crews can be discharged as soon as fire occurs, the central organization must be kept intact. The executives, clerical force, foremen and watchmen must be continued on the pay roll in order to get the business re-established.

(5) Insurance premiums. Of course, if a building is destroyed, insurance on it terminates. But all the other kinds of insurance continue in force and must be paid. These will include workmen's compensation or employers' liability, pay roll hold-up, fidelity bonds, business life insurance and insurance on any sections of the plant that are undamaged.

(6) Marketing expenses — advertising, salesmen's salaries and expenses. If fire puts a firm out of business for six weeks, it does not want to see its customers go over to competitors. So it will keep its salesmen on the road cultivating good will and working up future orders. It may be advisable even to put on an extra heavy publicity campaign to show your customers that like the phoenix your firm will rise up out of the charred ashes stronger than ever. So marketing expense certainly may go on after fire. The payment of insurance for advertising, says an interruption policy, shall be based on the experience during the corresponding period of past years, taking into account any new plans which the management had laid out for the future.

(7) Net profits. The stockholders of a corporation, whether they are the active managers or not, have invested money in the business with the expectation of receiving continuous profits. In many cases the passing of dividends would mean the cutting off of an income necessary for living. When fire comes and dividends are stopped for the months or year of rebuilding, many a stockholder may grumblingly wish that he had put his money somewhere else. In other words, the management of a corporation is morally obligated to make dividends continuous, and interruption insurance will keep them so.

The business interruption policies now on the market will indemnify adequately for the above losses, but they have two rather serious weaknesses. The ideal arrangement, of course, would be to advance a flat premium and in return get a simple promise to pay the actual loss without any technicality. No insurance company could assume so indefinite a risk. The next best thing is a policy which will pay any loss that can be proved with the sole limitation that the insured must carry insurance equal to the total possible loss. (In professional language, that is, it contains a 100 per cent coinsurance clause.) This form of

policy has just been secured by a national clothiers' association. It will probably become general because of its flexibility. But the conservative business world moves slowly and for the time being we have to limp along with a less desirable policy. This form says that the insured must estimate in advance what his loss due to interruption of operations will be for each working day. The policy will contain a chart about as follows:

"Indemnity not to exceed the following amounts for each working day between the dates indicated:
Jan. 1 to Feb. 15 nothing; Feb. 16 to March 31 $50; April 1 to Oct. 31 $100; Nov. 1 to Nov. 30 $50; Dec. 1 to Dec. 31 nothing.

(Note.—If the plant should burn on December 1st in the above case and be rebuilt before February 15th, there would be no interruption loss or insurance, because there would be no operating income at this season. Winter expenses are not an interruption loss because they are always met out of surplus.) This limitation does not impair the validity or need of the policies. But it does mean that the insured must make an extremely accurate forecast of what his loss might be at every season of the year.

The second weakness of the present interruption policies is in their handling of partial losses. A partial loss, by the way, does not mean the burning of part of the plant. It means the partial suspension of operations. Frequently the destruction of a part of the property (the power house or even a single piece of machinery, for instance,) will tie up all other operations and in such case the interruption loss is total. But there may be some sections of a plant which run independently enough that their destruction while bringing a reduction of income would involve a complete shutdown. The insurance payment for this partial loss is limited to a proportionate part of a total one. But in fact the income may be more curtailed than the expenses by a small loss. This possible discrepancy is undesirable but not vital. The big loss is the reason and basis for carrying insurance, for in the sand, gravel and stone industries operations are so interrelated that the stopping of one machine will involve a complete suspension of business.

More people fail to buy interruption insurance because they never heard of it than refuse to be sold because it costs too much. For the business world as a whole the cost has been worked out on a scientifically accurate basis, so that from year to year the premiums just about equal the losses plus the expense of running the insurance companies. The rate charged is usually the "80 per cent-" or "90 per cent-coinsurance rate" for the plant, which means that it can be figured as easily as property insurance. If, for instance, the rate for your ordinary fire insurance is $1 per $100 of value and you carry insurance of $30,000, your annual premium will be $300. Similarly the cost of interruption insurance will be figured as follows:

Rate, $1 per $100.

Number of working days in year, 200.

Daily loss of income due to inoperation (less such expenses as labor which can be stopped), $100.

Total annual interruption loss, $100x200 equals $20,000.

Cost, $20,000 at $1 equals $200.

In case the daily loss would vary from month to month the total will be the sum of the amounts given for each working day of the year.

Interruption insurance is cheap for the sand, gravel and stone industries. It can be bought for less than the risk is worth. This arises from the fact that in most states the rate charged is the same as for property damage. Now in many lines of business—machine shops, wood workers, retail stores—operations are continuous; there is little specialized machinery and a complete new equipment could be delivered and installed within two months. With our industries, however, we have first of all a short season, so that a nine months' stop means a year's loss of income. And secondly we have elaborate machines that cannot be picked up at any local market, and we are likely to have a big delay in installing new equipment. If basis rates, then, contemplate an interruption of only two or three months where our loss can amount to a year's income, it is obvious that the rates for our industries are relatively lower than for business in general.

Fire is the most common and spectacular of catastrophes. So naturally fire insurance is the most widely known in the field of business interruption. But the dual feature of property damage and a consequential loss of income is found in all the physical accidents that can befall a plant. And

in the case of at least six or seven kinds of calamity the consequential loss of revenue has been computed on a satisfactory basis for insurance.

Next to fire, the most probable loss is from windstorm. The subject of this insurance is "tornado, windstorm and cyclone." It includes damage done by any wind of more than normal velocity. The rate charged through much of the country is twelve cents per $100. On the basis of our previous illustration, with 200 working days in a year and a daily loss of income of $100, the premium would be $24.

There is no part of the United States that is free from windstorm hazard. Tornadoes strike every state almost annually, and winds high enough to wreck machinery are not uncommon. A windstorm loss is almost as likely to occur as fire, but it has in its favor the chance that machinery will be only partly wrecked and can often be repaired without unreasonable delay.

The most untimely disaster in the sand and gravel industries is flood, for this usually comes at the beginning of the producing season when the wrecking of the plant means ruin for the year. The risk of flood damage depends so much on varying local conditions that general advice on policies and rates cannot be given.

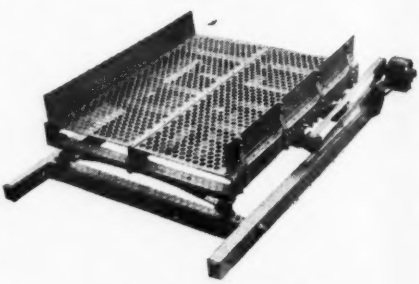
Three other forms of business interruption insurance are important enough to be commented on: (1) Riot and explosion — covering shutdowns due to labor trouble, blasting, gas explosions, etc. The value of this insurance depends on the extent of these risks in each individual plant. (2) Steam boiler explosion—where power is furnished by a local heating plant, trouble in the boiler house can tie up everything. (3) Water damage from rain or snow—a serious risk in the mercantile world but not important in our industry.

So much space in this article has been given to fire insurance partly because the principles are the same for all lines and need be detailed for any one only. And also, while the other lines are still in an introductory stage, the fire insurance is already generally carried by substantial corporations and is fast becoming universal.

This article does not attempt to force the carrying of both property damage and business interruption insurance. For a firm can actually become "insurance poor"—buy more protection than the earnings will stand. It is important, though, that the buyer of insurance should have a full knowledge of principles on which to base his decisions, for it is possible that the interruption of operations may be the most serious loss our business can face.

Universal Company's Special New Type "F" Vibrator

A battery of six of the Type F Universal vibrating screen was recently installed by the Carnegie Steel Company, at their McDonald Mills, Ohio Plant. This screen is 4 feet 8 inches by 6 feet. This type of screen was originally designed for use in slag and coke plants, but has proved to be equally successful on stone, gravel, coal, etc., and many installations have now been made for handling these different materials. The screen shown in this cut is equipped with perforated plate. Heavy wire cloth may also be used if desired. The mechanical vibrating assembly mounted beneath the cloth or plate is thoroughly protected from wear of material and its special oversize bearings are absolutely dust tight. This screen weighs approximately 1,050 pounds without motor and driving attachments.



New Type "F" Screen

As usual, Thomas H. MacDonald, Chief of the United States Bureau of Public Roads, has accepted the invitation of the Association to speak and will take advantage of the occasion to put before the representatives of every phase of the great highway industry some of the plans of the Federal Government for highway construction. His subject will be, "Building a System of National Roads Through Federal Aid," and it will follow the opening address of President J. H. Cranford on Tuesday, January 6th.

Memphis Company Builds New Plant Where Old One Disappeared

New Plant Is a Modern Elevated Concrete Structure Central Sand and Gravel Company Rebuilds Quickly

PRESUMABLY you've heard the one about the Irish section foreman who was addicted to the habit of making very verbose reports to the Super. The Old Man stood it for a year or two and then wrote as follows:

Mr. Pat Gallagher,
Fairlee, Vermont.
Dear Sir:—

Please be more concise in your reports.

Yours truly,
G. W. Cree, Supt.

Time elapsed, the Connecticut River went on a rampage and wiped out about four miles of Pat's track. The next morning this message was laid on the Old Man's desk:

Mr. G. W. Cree, Supt.,
Lyndonville, Vermont.
Dear Sir:—

Mile Post 37 to Mile Post 41. Where the track was the river is.

Yours truly,
Pat Gallagher.

Change the scene to Memphis, Tennessee, and the word "track" to "the plant of the Central Sand and Gravel Company" and you have, in a nutshell, the foundation of this story.

In the remote days between the close of the Paleolithic Age and the first time that Bryan ran, some energetic soul started a little sand and gravel plant where Nonconnah creek flows into the Mississippi a few miles below Memphis. As the years passed, there was a steady succession of owners, each adding a few tons of machinery and equipment to the load already imposed on the river bank. Eventually the Central Sand and Gravel Company, a subsidiary of the Fischer Lime & Cement Co., was incorporated to take over the plant and they went one better than anyone else by installing more weight than their combined predecessors had done.

About ten-thirty on the night of the twentieth of September in nineteen twenty-three the night watchman at the plant heard a dull rumble and felt a slight tremor under his feet. A few seconds later he heard a reverberating, grinding crash about a thousand yards from where he then was, but in the immediate vicinity of where he had been when he felt the first tremor.

Davenport Locomotive for Hauling Cars

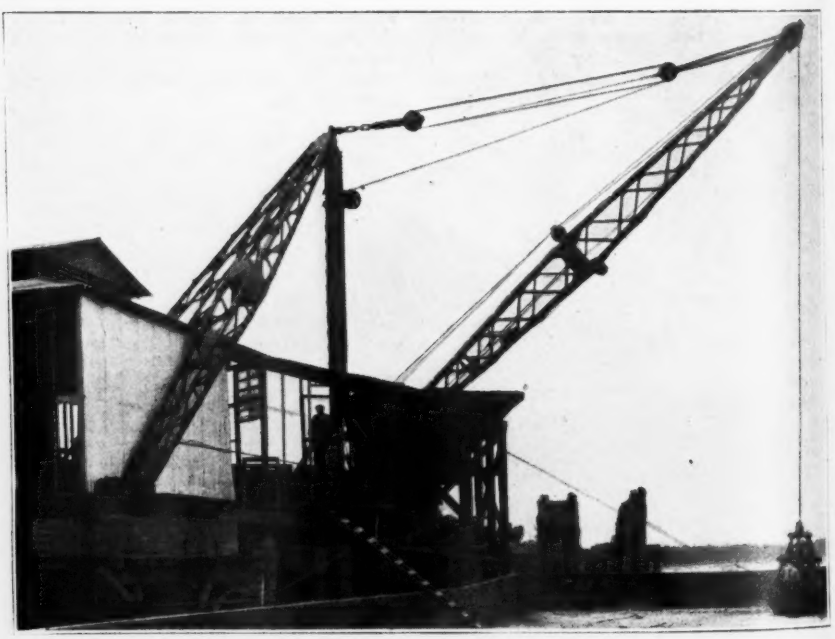
The old river bank, weakened by years of heavy loading and the repeated shocks and jars of heavy machinery long operated, had given up the ghost in the night and had slid to its last resting place in the bed of the river.

The morning sun disclosed a scene akin to a shell-swept village in France. Where the plant had stood was now a crater a hundred yards across. Trestles, railroad cars, derricks and storage bins were in a hopelessly tangled mass like titanic jackstraws tossed carelessly by a giant hand. To attempt to salvage the plant as a whole was out of the question; indeed, at first sight, it was a strain on one's optimism to believe that any individual piece of machinery could be made to run again. After sizing up the situation in the early morning light the decision was made to build anew and do it quick.

The building of the new plant involved much more than the erecting of a few bins and a derrick or two. The source of supply of both the sand and gravel produced and marketed by the Company lies in the bed of the Mississippi River nearly fifty miles above Memphis. The deposit there yields material of a remarkably high quality but bears some appreciable amounts of silt and lignite which must be removed before the material is in marketable condition.

The material is raised from the river bed by the hydraulic dredging method and is brought down to the plant in steel barges. The company owns and operates two barges, each thirty-six by one hundred seventy-five feet in size and of ten foot draft. The standard method of operation is for the Company's combination dredge and tow-boat—the "Dwight M. Armstrong," a craft of four hundred tons displacement with a rating of three hundred H. P.—to take one of these material barges upstream, pump it full of material, then bring it back to the plant and leave it for unloading while it repeats the process with the other barge. These barges have a capacity of twelve hundred tons and make the round trip in eighteen hours.

The dredge carried by the "Armstrong" is a fifteen inch, manganese lined centrifugal pump capable of pumping two hundred twenty yards of material an hour while operating at a speed of two hundred seventy-five R.P.M. As lifted from the river this material is passed over a screen



Hoisting Equipment for Unloading the Barges

to remove the excess sand and silt and is then dumped into the cargo barge.

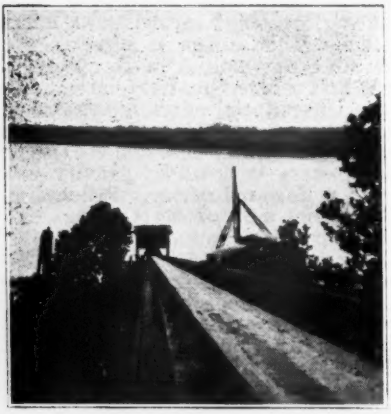
Arriving at the plant the barge is unloaded by a two and a half yard clam shell bucket, capable of handling two hundred yards an hour, and the material is deposited by this bucket into a hopper that feeds a thirty inch belt conveyor extending up a fifteen per cent incline to the top of the main plant, located back away from the water's edge for the sake of safety.

In the main this plant is an elevated concrete structure two hundred feet long by thirty-four feet wide, divided into twelve bins with an aggregate capacity of forty-eight hundred tons directly over a double track standard gauge railroad for outbound loading by gravity. Of course, there is a complement of screens, crushers and washers.

The belt mentioned above carries the material a distance of three hundred eighty-five feet at a speed of three hundred twenty-five feet a minute and discharges into a rotary screen four feet in diameter by twelve feet long, revolving at fifteen R.P.M. This screen is directly over the first bin and is perforated with one and three quarter inch holes. Oversize material arriving here passes through the screen in a horizontal direction and falls into this first bin from where it flows by gravity to a crusher for reduction. Reduced to commercial size it is elevated into the second bin by an eighteen inch bucket conveyor. All material under one and three quarter inches falls through the screen to a second thirty inch belt traveling along the tops of the next five bins and is combed off the belt into the desired bin by an automatic tripper that can be moved to any point along this belt. The contents of these five bins are then fed by gravity to the lignite removing plant.

As this lignite is peculiarly a property of sand and gravel found in certain river deposits, it may be well to diverge from the main subject a bit. Turning to Webster we find that lig-

Interior View of Washing Plant



Belt Conveyor from Hopper

nite is a "variety of coal between peat and bituminous coal, especially one in which the woody texture is distinct." Though normally lighter in weight than water this lignite is frequently swept down into the sand and gravel beds by whirlpool and eddy action of the river and there covered by the constant accretions of sand and gravel. The presence of lignite in sand and gravel is highly objectionable, and it must be removed before these materials are used in concrete.

To parade a little Latin: The modus operandi of this removal is to sluice the sand and gravel with a large volume of water through a series of inclined chambers. Each of these chambers is about four feet square with sides of laminated cypress and a steel grate in the bottom and each succeeding chamber is about eight inches lower than the preceding one. Water is forced upward through these bottoms by plungers actuated by eccentrics mounted on an electrically driven shaft. The surge and sweep of the water carries the material from chamber to chamber with the sand and torpedo gravel settling and falling through the grates to a trough leading to a bucket conveyor. The larger gravel is tumbled along down from chamber to chamber and is led out through gates along the sides of the chambers to another trough and conveyor, while the lignite and other foreign substances lighter than water are floated out of the sluice to a waste pile.

The company has two of these machines, or jiggers as they are called, capable of operation either separately or simultaneously. The development of these jiggers has been evolutionary. Earlier plants and the first plant of this company had jiggers variously inferior in design and detail until, profiting by past experience, this new plant represents the very acme of refinement. The original plants had bottom grates of cast iron, but these were not generally satisfactory as the wearing then and ultimate breaking of one section of the grate meant the discarding of the whole grate. The present grates are made up of especially rolled structural steel sections so assembled as to permit of quick and comparatively inexpensive renewals of worn or broken parts.

Leaving the jigger the gravel is elevated by a bucket conveyor to a revolving screen with one and one quarter inch perforations; material smaller than this size falling into one bin and that large into another bin for shipment. The sand with some content of torpedo gravel goes up another elevator and passes over a set of screen bars to retain the gravel and chute it to the torpedo gravel bins while the sand and such silt as remains fall through and pass along to a pair of settling tanks.

The bucket conveyor, or elevator, bringing this material up has water-tight buckets, and the sluicing action of the water content carries off the silt while allowing the sand to settle and flow to the bins beneath the settling tanks which are so arranged as to separate the coarse sand from the fine and divert each to a separate bin.

Gates in the bottoms of these final storage bins are arranged in such a manner over the double track railroad as to permit the very rapid loading, by gravity, of sixteen standard railroad cars without uncoupling the switch engine.

The plant as a whole has been constructed in what is probably record time. Though due largely to the efforts of the Company, very substantial tribute is due to the various manufacturers and distributors for their cooperation in turning out the necessary equipment.

The various makes of equipment which were furnished almost overnight include the clam-shell bucket by Hayward; the derrick and hoisting machinery operating it by the American Hoist and Derrick Company; the conveyors, automatic tripper and settling tanks by Stephens-Adamson; the crusher by Kennedy; the grates

and other equipment for the jiggers, also the pump on the Armstrong, by W. C. Ellis and Sons of Memphis; the belts by Goodyear; and the fifty H. P. motors for the belts, elevators and jiggers by Westinghouse.

As it stands today, this company is in a position to furnish sands and gravels of the highest quality in quantities equal to those of any other plant in the South. However, the morning after the night before, more specifically on the morning of September the twenty-first in nineteen twenty-three, after looking at the hopeless tangle on the river bank, any member of the company would have been an acceptable model for a frontispiece for an autographic copy of Riley's "The Discouraged Farmer"; but the wreck seems to have been a blessing in disguise as the company is now in position to distribute its products at a cost that will soon wipe out the expenditure occasioned by the construction of the new plant.

Austin Company Expansion

WITHIN the next few weeks The Austin Company, Industrial Building, Cleveland, in anticipation of greatly increased activity, will begin to place orders for materials to cover 1925 requirements. At the company's store yards at Cleveland, Philadelphia and Chicago, large stocks of structural steel in shapes, plates, and bars, steel sash of standardized types, lumber, glass, putty, and other materials are kept in stock.

Because of this company's country-wide operations large quantities of some materials will be bought locally (in Cleveland) such as cement, sand, brick, aggregate (stone, slag and gravel), roofing, maple flooring, rolling steel doors, wood doors, paint, wood block flooring, reinforcing steel, mechanical sash operating devices, corrugated roofing and siding, gypsum roofing, cement tile roofing, and other miscellaneous lines. An idea of the quantities of such materials purchased may be gathered from such figures as these: 200,000 barrels of Portland Cement, 100,000 yards of aggregate, 20,000,000 brick, 22,000,000 ft. of lumber, 10,000 tons of steel shapes, 30,000 tons of fabricated structural steel, 2,500,000 sq. ft. of composition roof waterproofing. Approximately 25,000 cars would be required to transport this material, which would total (altogether) about $7,000,000 in value.

Another index to the requirements of Austin operations may be found in the fact that there are close to 100 construction projects under way at any given time. These projects include complete plants, costing over a million dollars, as well as small plant units, in the form of extensions and separate buildings.

New Malleable Iron Safety Collar

IT IS estimated that ten per cent of the power generated in the average industrial plant is wasted between the generator and the consuming machine. Attention to this loss of power has given rise to changes in power transmission equipment and the development of more efficient mechanical means.

One of the most recent developments along this line comes from the Link-Belt Company of Indianapolis—the device illustrated by the accompanying photographic reproduction. This new Safety Collar is intended to maintain the proper alignment of such equipment as pulleys, shaft bearings, hangars, etc.

Great strength, toughness, durability, and light weight have all been incorporated in this new Malleable Iron Safety Collar, in addition to which, a new design which permits the collar to be split in two pieces, thus affording ready and economical installation or adjustment. This type of collar, however, is made also in the solid ring type, both types being accurately machine finished, assuring a tight fit and a pleasing appearance.

Exhaustive tests made with the Link-Belt Safety Collar have proven it to be impervious to shocks and strains encountered in heavy duty service. The material of which it is made possesses unusual wear and rust resisting qualities. This extends its sphere of usefulness to installations where the atmospheric conditions contribute to rust or excessive abrasiveness. The set screw, by which the collar is firmly affixed to the shaft, is flange protected.

As with the recently perfected "Kex-Top" grease cup, the Link-Belt Malleable Iron Safety Collar will be marketed through dealers located throughout the country, thereby assuring prompt service and shipment.

N. S. G. A. Program

THE general plan of the ninth annual convention of the National Sand and Gravel Association to be held in Chicago January 5, 6 and 7 will be as follows:

Monday, January 5, 1924

10:00 Registration of members and guests on mezzanine floor of the Auditorium Hotel. Registration will continue throughout the convention.

12:30 Meeting of the Board of Directors, beginning with luncheon.

Tuesday Morning, January 6, 1924

10:00 Address of Welcome. John Sloan, President, Chicago Board of Public Improvement. Mr. Sloan will be introduced to the convention by Frank W. Renwick, Chicago Gravel Company.

10:30 Annual Address of the President.

10:45 Report of the Secretary-Treasurer.

11:00 Winter Concrete Construction. H. S. Wright, Portland Cement Association, Chicago.

11:30 1. "Workmen's Compensation Insurance." John A. Gunn, President, Employers' Mutual Casualty Association of Iowa.

2. "Making 'SuperSand' from Gravel." Alex W. Dann, Keystone Sand and Supply Company, Pittsburgh.

3. Methods of Repairing bad-order cars and suggested methods of relief from inadequate equipment. W. E. Rogers, Arkansas River Sand Company, Sand Springs, Okla.

4. "My Experience as a Manufacturer of Concrete Brick." A. P. Burke, Atlanta Sand and Supply Company, Atlanta, Ga.

5. "Loading Materials in Freezing Weather." R. Snoddy, Coon River Sand Company, Des Moines, Iowa.

6. "What discount rate for prompt collections?" A. E. Frosch, East Liverpool (Ohio) Sand Company.

(Members especially interested in any one of these topics are urged to get in touch with the speaker before leaving the convention hall.)

1:00 Adjournment for luncheon.

Tuesday Afternoon, January 6, 1924

2:30 "Weighing of materials and legal obligations of carriers with respect to installation of track scales." Nuel D. Belnap, of the legal firm of Walter, Buchmore, Collin & Belnap, Chicago.

3:00 Open Forum for Discussion of Operating Problems in the Sand and Gravel Industry.

The President will assign the different topics to producers familiar with the peculiar problems to be discussed.

These subjects may be discussed by the whole convention, or the convention may be divided into group meetings, as circumstances warrant.

Tuesday Evening, January 6, 1924

Annual Dinner, Auditorium Hotel, Informal at 7:00 o'clock. Orchestra Music. Dancing. Professional Entertainment.

Wednesday Morning, January 7, 1924

10:00 An Address—"Urgent necessity of early movement of material during 1925."

This is an address which every sand and gravel producer should hear. It will be delivered by an authority, one who is in a position to show the absolute need of early movements of sand and gravel in 1925.

10:30 Gravel as Railroad Ballast. Robert H. Ford, Assistant Chief Engineer, Rock Island Lines, Chicago.

10:45 Campaign for clean materials in Southern California. Lawrence L. Rogers, Union Rock Company, Los Angeles, California.

11:00 Report of Car Demurrage Committee. T. E. McGrath, McGrather Sand and Gravel Company, Lincoln, Illinois, Chairman.

11:30 Promoting Wider Use of Washed Sand and Gravel. (This promises to become the National Association's major function. Members will be asked to give their views as to procedure to be followed in extending the use of our materials.)

12:00 Consideration of report of Board of Directors.

12:15 Reports of committees.

12:30 Annual election of officers.

1:00 Adjournment of the convention.

YOU'LL SAVE MONEY

By Using a Haiss Truck Loader in Your Sand or Gravel Bank

You men who have sand and gravel that is sold without washing, or with a single screening, can make a big cut in your production costs with Haiss Loaders.

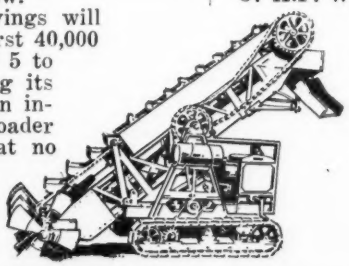
An Ideal Machine for the Smaller Operation

Even if you get out only 50 yards a day for 3 or 4 months in the year, a Haiss Loader will save enough to pay a profit over all charges and interest on your investment. And the machine has capacity to speed up your production to 300-400 yards a day—as your better prices cause your business to grow.

The Loader's savings will pay for it in the first 40,000 yards handled—and 5 to 8 times over during its effective life. As an investment a Haiss Loader is so profitable that no man who operates even two or three trucks can afford to ignore it. Let us tell of the experience of sand and gravel men who have been using these machines—the evidence is convincing.

Digs in Any Bank

The wonderful digging ability of the Haiss Feeding Propellers, the slow-speed Crowding Drive, the big 37 H.P. Waukesha Motor—these and brute strength in every part make this a machine which will actually dig its own way into a gravel bank. No planking needed—and you load right at the face.



Ask for Catalog 523

Tell us Your Conditions

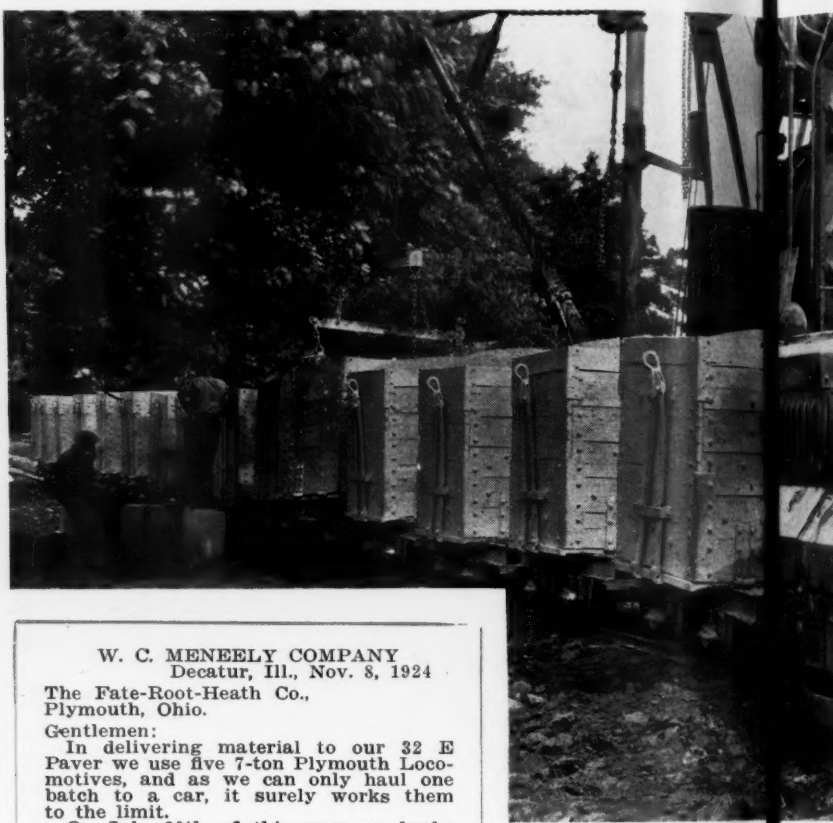
Manufacturer of THE GEORGE HAISS MFG. CO. INC Established 1892

-Truck and- Wagon Loaders
Portable Belt Conveyors

Clam Shell -Buckets-
Mail Handling Equipment.

142d St. and Rider Ave., New York, N. Y.

Representatives Throughout the World.
Millars Timber & Trading Co., London, British Representative.
Cable Address "Coalhoist" New York—"Western Union 5 Letter Edition" Code.



W. C. MENEELY COMPANY
Decatur, Ill., Nov. 8, 1924

The Fate-Root-Heath Co.,
Plymouth, Ohio.

Gentlemen:

In delivering material to our 32 E Paver we use five 7-ton Plymouth Locomotives, and as we can only haul one batch to a car, it surely works them to the limit.

On July 30th of this year we broke the world's record by laying 2,671 feet of standard 18 foot concrete pavement in one day. For the week ending July 31st we also set another new record, completing 10,405 feet of standard 18 foot pavement.

All five locomotives worked perfectly without breakdowns or mishaps on this big day and week's run. On the season's run of 22.7 miles there was practically no delay caused by the Plymouth Locomotives.

We would not consider using any other Locomotive except the Plymouth.

Yours very truly,
W. C. MENEELY COMPANY,
(Signed) W. C. Meneely.

See Our Exhibit at
National Good Roads Show
Chicago, Jan. 5-9

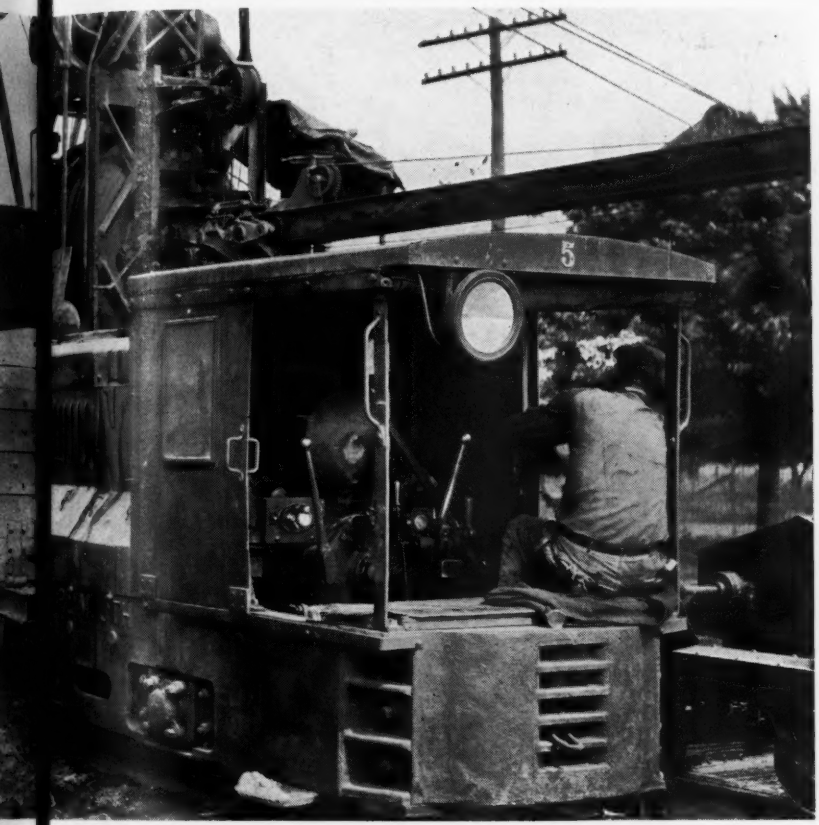
Two Wor R

2,671 feet of stand ft. co
pavement in one

10,405 feet in one w

Those are the rema ords h
by Wm. C. Meneely e past
They are additional t for P
Gasoline Locomotives strial

Gasoline PLYM

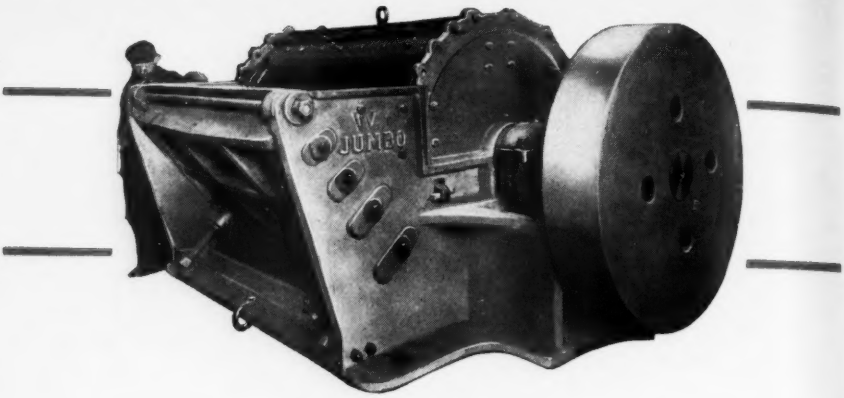


Records SMASHED!

and naturally we take a pardonable pride in knowing that Plymouths played such a prominent part. Read now the letter from Mr. Meneely—then write for Bulletin HC206 showing what others are doing in your field.

THE FATE-ROOT-HEATH COMPANY
Plymouth Locomotive Works
PLYMOUTH, OHIO

PLYMOUTH Locomotives



"Doubled Capacity" "Cut Crushing Costs One Half"

"Secondary Crusher Not Needed"

JACKSBORO CRUSHED STONE CO.
JACKSBORO, TEXAS

The Williams No. 4 "Jumbo" crusher at the Jacksboro Crushed Stone Co. plant, is a sample of what can be accomplished with Williams hammer crushers in making unusually uniform macadam. Their machine takes quarry run rock up to 18" and reduces to 1¼" in one operation. It replaced two gyratory crushers at 50% less investment —bigger rock is handled and operating costs have been cut by half.

This machine is one of 5 Williams crushers owned by 4 quarries within a 25 miles radius. All were purchased within one year after the first Williams was installed in that district. If you contemplate new crushing equipment for any purpose, write us.

Williams Patent Crusher & Pulv. Co.
802 St. Louis Ave., St. Louis, Mo.

CHICAGO 37 West Van Buren St. | NEW YORK 15 Park Row | SAN FRANCISCO 415 5th Street

Williams
PATENT CRUSHERS GRINDERS • SHREDDERS

Balance Sheet Organization

Written Expressly for PIT AND QUARRY by D. J. HUTCHINSON

DECEMBER thirty-first marks the end of the fiscal as well as the calendar year for most business concerns. It is appropriate therefore to consider some of the accounting problems which arise when the books are closed and the fiscal statements are prepared.

One of these is the preparation of the balance sheet or financial statement. The balance sheet may be likened to a slow motion picture camera which catches the actor in the midst of his activities and secures a permanent record of his position at the moment the exposure is made. The balance sheet is such a picture of the activities of a business presenting a permanent record of the condition of affairs at the given moment.

This moment is the end of the fiscal year. The condition of affairs at that time is the result not only of the operations of the current year but of all the factors that have influenced the business in the past which the final summary is the balance sheet, the most important statement issued by the accounting department. Moreover it is the most widely read, and for that reason also it should be the most carefully prepared, not only with respect to content but with respect as well to the form and manner in which the information it contains is presented.

It is with this latter aspect of balance sheet preparation or rather organization that we are now concerned —the proper presentation of balance sheet information, assuming that the figures from which such information is to be obtained are already available. In a sense the preparation of the balance sheet involves the whole accounting process which is carried on primarily for the purpose of providing the balance sheet figures. But after the figures have been provided, all the work that has gone before may be largely vitiated if the figures obtained are improperly organized and presented. The balance sheet is all the many of those interested in the business have by which to judge its progress and condition. Hence the policy of putting the best foot forward demands that the balance sheet be carefully prepared. It is not sufficient that it should be a true statement; it should also be an intelligible one.

In order to make the balance sheet intelligible it is necessary to consider first the nature of the business and its particular financial characteristics, and secondly the purposes for which statement is to be used and the information which it is desired to convey. The balance sheet of a merchandising concern will necessarily differ considerably in form as well as in content from that of a public utility; and a balance sheet which is to be used as the basis for current borrowing will emphasize a different aspect of the financial condition of the business from one that is to be used in a report to the holders of long term securities.

There is certain significant information that is to be obtained in the ratios of one factor in the statement to another. The most familiar of these is the current ratio or ratio of current assets to current liabilities The most familiar balance sheet is therefore the one which emphasizes this ratio by placing these items at the top of the balance sheet. Other arrangements of the balance sheet emphasize other aspects of the financial condition. Hence the form of the balance sheet should be determined to some extent by the financial purposes for which it is to be used and by the interests of those for whose information it is intended.

Thus bankers and general unsecured creditors are primarily interested in the current ratio since it is to be the current assets that they must look for the ultimate satisfaction of their claims. The permanent assets even though unencumbered offer very little security to the creditors on open account or unsecured notes, as the trouble, time and expense involved before they can be converted into cash make them practically unavailable.

On the other hand mortgage holders are primarily concerned with the permanent investment that represents not only the security behind their investment but the potential earning power that ensures the continued payment of the interest charges. The owners or stockholders are principally interested in the excess of total assets over total liabilities that represents their equity in the business, while the management, as distinct

from the owners, is concerned with the working capital that is available for the current operation of the business.

Thus different individuals who are interested in the business from different points of view are primarily concerned with different aspects of its financial condition, although possibly interested in other aspects as well, and the balance sheet should be prepared in such a manner as to emphasize the particular aspect of the financial condition in which the person for whom it is intended is interested.

Different forms of balance sheet which emphasize different aspects of the financial condition are given in the accompanying figures. Figure 1 illustrates the familiar current form wherein the emphasis is placed on the current ratio. Figure 2 may be called the fixed form which brings out particularly the relation between the fixed or permanent assets and the fixed or long term liabilities. Figure 3 is the workin capital form which illustrates the method of organizing balance sheet figures to show clearly the amount of available working capital.

No one of these or many other acceptable forms can be said to be preferable to any other. Their use is to be determined by the conditions already described. Nor do the forms given illustrate all of the possible arrangements of balance sheet figures, but they show how different aspects of the financial condition may be brought out as occasion demands by different arrangements.

The significance of balance sheet figures depends primarily on the ratios between the various factors in the financial condition. A single figure such as the amount of cash or deposit or of accounts payable has very little meaning in itself except as it indicates the size of the business and the extent of its operations. It is only when such figures are taken in their relation to each other that they become significant. Hence the importance of a balance sheet arrangement which will bring out the important ratios in the light of which alone the statement can be interpreted.

There are a number of these balance sheet ratios each of which explains some factor in the financial condition of the business. The first is the current ratio which we have already discussed, which states the ability of the concern to meet its current obligations and to a large extent measures its desirability as a credit risk. This ratio is the most familiar but its importance is often overemphasized through losing sight of the fact that it is relatively easy to manipulate the current ratio, as will appear from a simple example.

If a concern has $75,000 current assets and $50,000 current liabilities, the current ratio is 1½ to 1, which is the generally accepted minimum of good business. Suppose it pays off $25,000 of its liabilities which then amount to $25,000 against $50,000 current assets. The ratio has jumped to 2 to 1, and this can be accomplished quite easily. It is only necessary to conserve the cash toward the end of the year, pay off the liabilities on the last day and immediately borrow the money again on the first day of the new year, it shows a higher ratio than the firm is really entitled to. Hence the current ratio taken alone may be misleading unless it is known for how long a period such a ratio has continued.

There are other balance sheet ratios that are just as informative as the current ratio. This ratio of total liabilities to net worth (capital and surplus) is a very illuminating ratio as it shows the extent to which the business is being carried by the creditors in relation to the extent to which it is being financed by the owners. Thus taking total liabilities and net worth as 100 per cent an average of 18 machinery manufacturers in 1921 showed the liabilities of 13 per cent against net worth of 87 per cent, while an average of five meat packing companies showed liabilities of 51 per cent against a net worth of 49 per cent.* It is evident that in the latter case the creditors are financing the business to a much larger extent than the former case. This ratio reveals one of the most important facts to be gleaned from the balanced sheet—namely the source of the capital which has gone into the business, whether it has been supplied by the owners or by the creditors.

The same question as to the source of the capital is further explained by a third important ratio, that of surplus to the capital or investment accounts, which reveals how much of the owner's capital has been put into the business from the outside and how

*Bliss: Financial and Operating Ratios in Management.

Figure 1.
JONES & SMITH (NOT INC.)
BALANCE SHEET
December 31, 1924

Assets				Liabilities		
Current Assets				Current Liabilities		
Cash			$ 250,000	Accts. Payable		$ 2,200,000
Accts. Receivable			4,400,000	Notes Payable		1,000,000
Inventories			2,000,000			
Tot. Cur. Assets.			$ 6,650,000	Total Current Liabilities		$ 3,200,000
Fixed Assets				Long Term Liabilities		
Land		$1,000,000		Mort.—6% due 1930		1,000,000
Buildings	$ 4,000,000			Net Worth		
Res. for Depn.	1,600,000	2,400,000		A. B. Jones	$5,900,000	
Machy. and Equip.	$12,500,000			B. A. Smith	5,900,000	11,800,000
Res. for Depn.	7,500,000	5,000,000	8,400,000			
Other Assets						
Deferred Expenses.		$ 150,000				$16,000,000
Good will		800,000	950,000			
			$16,000,000			

Figure 2.
JONES & SMITH, INC.
BALANCE SHEET
December 31, 1924

Assets			Liabilities		
Land		$ 1,000,000	Fixed Liabilities		
Buildings	$ 4,000,000		Mortgage Bond — 6%, due 1930 (Secured by all land, bldgs., machinery and equipment.)		$ 3,500,000
Res. for Depn.	1,600,000	2,400,000			
Fixed Assets					$ 3,500,000
Machy. and Equip.	$12,500,000				
Res. fr Depn.	7,500,000	5,000,000			
Total Fixed Assets.		$ 8,400,000	Current Liabilities		
Current Assets			Accounts Payable	$ 2,200,000	
Cash	$ 250,000		Notes Payable	1,000,000	3,200,000
Accounts Received.	4,000,000				
Inventories	2,000,000	6,650,000	Capital		
			Capital Stock	$ 5,000,000	
Other Assets			Surplus	4,300,000	9,300,000
Deferred Expenses	$ 150,000				
Good will	800,000	950,000			$16,000,000
		$16,000,000			

Figure 3.
JONES & SMITH, INC.
BALANCE SHEET
December 31, 1924

Assets			Capital		
Fixed Assets			Capital Stock	$ 5,000,000	
Land		$ 1,000,000	Surplus	4,300,000	$ 9,300,000
Buildings	$ 4,000,000				
Res. for Depn.	1,600,000	2,400,000	Mortgage Bonds—6%, due 1930		3,500,000
Machy. and Equip.	$12,500,000				
Res. for Depn.	7,500,000	5,000,000	Total Invested Capital		$12,800,000
		$ 8,400,000	Current Liabilities		
Other Assets			Accounts Payable	$ 2,200,000	
Deferred Expenses	$ 150,000		Notes Payable	1,000,000	3,200,000
Good will	800,000	950,000			
Working Capital Carried Down		3,450,000	Working Capital Brought Down		3,450,000
Total Fixed and Working Capital		$12,800,000			$ 6,650,000
Current Assets					
Cash	$ 250,000				
Accounts Receivable	4,400,000				
Inventories	2,000,000	6,650,000			
		$ 6,650,000			

much of it has accumulated through earnings that have not been withdrawn. This ratio may bring out two important facts regarding the business; the profitableness of the enterprise, and the conservativeness of the dividend policy. If the ratio of surplus to investment is low, either the business has not been profitable or the dividend policy has been too liberal. On the other hand if the ratio is high, the reverse conditions are indicated.

Next to the source of the capital in the business the most important fact revealed by the balance sheet is the disposition of the capital. This is to be gathered from the ratio of current to fixed assets, as to whether the capital has gone largely into permanent assets or is retained in liquid form.

Conditions in this respect again vary widely as between different businesses. For example department stores will average about 3 to 1 current assets to fixed assets, while the mining industry shows a reverse ratio of 1 to 3. The explanation of course is simple and lies in the fact that the investment of the department store is largely in current assets, merchandise and accounts receivable, while the mining company has a heavy investment in plant and machinery. Thus the type of business must be taken into consideration in judging the significance of the various ratios. In each industry, however, there are certain limits within which the ratios should usually be kept to conform to good practice and sound business policy, and the position of any individual firm can be judged to a large extent by the conformity shown to the standard ratios for the industry.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20 cents each. State number of patent and name of inventor when ordering:

1,515,956. Grab-bucket. Edward P. Healey, New York, N. Y.

1,516,204. Gravel-separator. Carl N. Olson, Pueblo, Colo., assignor of one-half to Fountain Sand & Gravel Co., same place.

1,516,428. Elevator, dredger, excavator, and the like. George Handley, Palmers Green, England.

1,516,878. Hoisting apparatus, Edwin J. Armstrong, Erie, Pa., assignor to Erie Steam Shovel Co., same place.

1,517,312. Mounting for rock-drills. Gustave M. Nell, Denver, Colo., assignor to Denver Rock Drill Mfg. Co., same place.

1,517,538. Crushing-mill. Arthur C. Daman, Denver, Colo.

1,518,314. Excavator scoop and carrier therefor. Robert R. Downie, Beaver Falls, Pa., assignor to Keystone Driller Co., same place.

1,518,333. Mining apparatus. Nils D. Levin, Columbus, Ohio, assignor to Jeffrey Mfg. Co., same place.

1,518,463. Excavating apparatus. Dana Spees, Sheboygan Falls, Wis.

1,518,757. Excavating mechanism. James C. Reid, Jr., Cleveland, Ohio.

Missouri Valley Association Holds Successful Meeting

THE Sixth Annual Meeting of the Missouri Valley Association of Sand and Gravel Producers, was held at the Muehlebach Hotel, Kansas City, on Tuesday and Wednesday, December 16 and 17. At this meeting, which had an attendance of almost one hundred per cent, the fine progress made under the leadership of President Frank W. Peck, and the constantly increasing worth of this association to the industry was revealed.

Much interest and enthusiasm was shown throughout the meeting, the discussions developing such a strong and practical nature as to make this one of the most helpful and successful meetings yet held. Some of the subjects which roused the interest of members were: An optimistic note as to business conditions during the coming year; the promotion of a wider use of our materials; the determination to better still further the quality of materials produced, which it is recognized already rank with the best now produced; a most satisfying condition of the treasury; a program of genuine values; the addition of ten new members to the membership list.

Among the social events on the program, all of which gave much pleasure to the delegates, were a theater party and a thoroughly enjoyable though entirely informal dinner at the Kansas City Club on Wednesday night, December 17. The hosts of this affair were the genial producers of Kansas City, with Mayor Bartlett as chairman of the entertainment committee. Mayor Bartlett's part in it, they say, has everything to do with the success of it. Lettered signs and personal messages decorating the walls of the banquet room contributed much to the amusement and enjoyment of the occasion.

The election of officers resulted as follows: W. E. Rogers was elected president; R. J. Stewart was elected vice-president, and N. C. Dunn, treasurer. One new member of the executive committee elected was Dr. J. H. Bass.

Taken altogether, the spirit of the meeting, the enthusiastic discussions, and the high ideals of the Associations so plainly set forth proved the value of the organization and assured its continued growth and success.

City of Winnipeg, Canada, Operating Large Quarry Department

Quarries Department with Four Plants Under City Engineers Operating Expenses Carried by Sales Without Appropriation

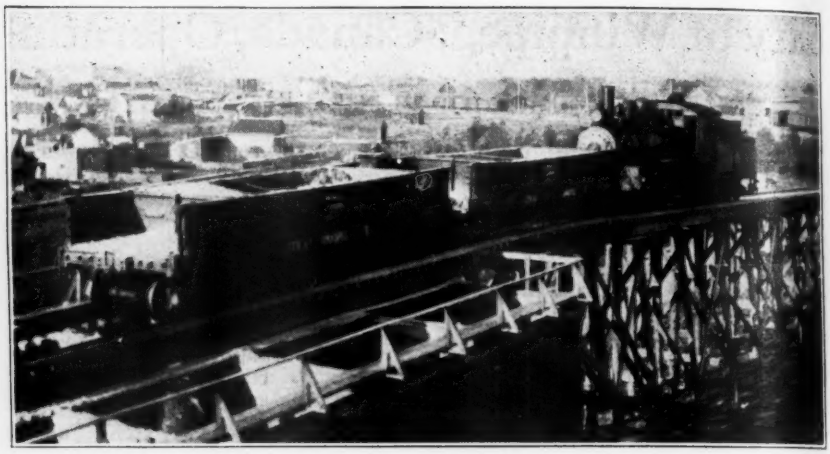
WINNIPEG was one of the first cities on the American Continent to adopt the day labor system. Up to the year 1897 the city bought sand, gravel and crushed stone from the commercial plants in the vicinity, but in that year a quarry site was purchased and a plant erected at Mount Royal, six miles from Winnipeg on the Canadian Pacific Railway. In the fall of 1905, the present plant was erected at Stony Mountain, 14 miles from Winnipeg. In May, 1906, operations began in what was then the largest municipally owned crushing plant in the world, and Winnipeg produced its own material for street and sidewalk construction.

The quarries department now consists of four plants: Plant 1. The limestone quarry at Stony Mountain. Plant 2. The gravel and sand pits at Bird's Hill. Plant 3. The granite crushing plant at Elmwood. Plant 4. The Central concrete mixing plant; the first in Canada.

The site of plant number 1 is naturally an ideal location for a quarry, rising abruptly from the level prairie to a height of about forty feet with a level hill top. The stripping is very light, ranging from three inches to three feet, with an average of about one and one-half feet. This is taken off by hand labor and hauled in dump wagons to the stripping dump. The drilling is done by Ingersoll Rand drills and light jackhammers, using air supplied by an Ingersoll Rand electrically driven compressor. From the blast the stone is trammed to the crusher on one and one half yard skips on narrow gauge light steel railway. The skips are hauled by horses and are dumped into the crusher from a tipple. The tipple eliminates the use of dump bodies on skips and allows the skips to be built low, making loading quicker and easier. The time taken to run a skip on the tipple, dump, and run off again is about one half minute. There are two tipples at the crusher.

The primary crusher is a Gates number 7½. It is set up on the side

View Showing Face of 70-Feet of Gravel



Dumping Material Into Bins at Plant No. 4

of the hill so that the hopper is on the level with the quarry floor. The scalping screen is 40 inches by ten feet. The secondary crushers are a number 3 Gates and a number 3 McCully. A fifty foot number 7½ elevator carries the stone to the sizing screen which is an Allis Chalmers revolving type 40 inches by 18 feet. The screens are located over the loading bins.

All the machinery in the plant is driven from a main shaft by a 150 H. P. motor. The power is supplied from the city's own hydro system coming from Winnipeg on a line carrying 13,000 volts. The sub station and transformers are located at the quarry plant, and serve also to furnish power and light to the Manitoba penitentiary, about a mile away. The railway spurs are laid on a ½ per cent grade. The train of empty cars is spotted above the plant and the brakes set. As the cars are required the brakes are released and the cars run down the incline under the bins; thus no spotting equipment is necessary. When the cars are loaded they continue down the incline and the train is made up. There is room on either side of the plant for twenty-five cars. The transportation is handled by the Canadian Pacific Railway and dump cars are used.

The gravel and sand pits of plant

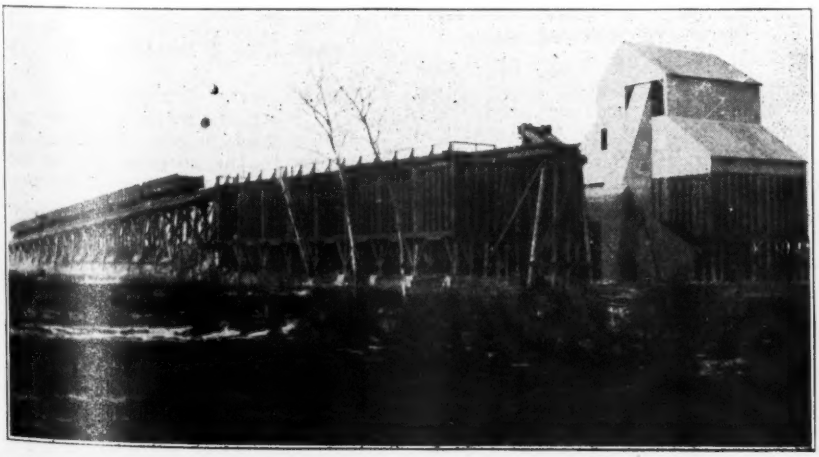
Hauling Cars on Circle Track at Plant No. 1

Dumping Cars Into Crusher at Plant No. 2

number 2 are located at Bird's Hill, seven miles east of Winnipeg on the Canadian Pacific Railway. There is a bank 70 feet high of clean gravel. The gravel was loaded for a time by hand labor but in 1912 a power line was run from the city's hydro system and an electric shovel and electric locomotive and 50-30 yard Hart convertible cars were put no the job. This incidentally was the first electric shovel west of Lake Superior.

Plant number 3 is located at Elmwood, a part of the city. This plant produces the granite used in the city street improvements as well as fine granite for stucco and chicken grit, which is sold on the open market. The equipment consists of one number 4 Allis Chalmer's gyratory crusher, one Symons 24 inch disc crusher, a 60-foot elevator, one 40 inch by 18 feet and one 24 inch by 10 feet revolving screen. The Allis Chalmers crusher is driven by a 40 H. P. motor while a 30 H. P. motor handles the Symons crusher. Another 30 H. P. motor takes care of the elevator and screens. The storage bins here have a capacity of 3,500 yards. From here limestone sand and gravel is delivered to the north side of the city.

Plant 4 is centrally located and is the yard used for the greater part of



CrushingPlant and Bins at Plant No. 3

deliveries of concrete to the different jobs throughout the city. Materials are brought in from Stoney Mountain and Bird's Hill in 30 yard cars and dumped in bins. From these bins which are 32 in number with a capacity of 3,200 yards, the sand and stone are conveyed to the concrete mixer by two 14 inch conveyors which are placed immediately underneath the bins. Each bin has a controllable gate to permit the required flow of material on the conveyor belts. The conveyors dump materials into two separate hoppers; these hoppers have hand operated gates so balanced that the operator can easily gauge the amount of stone and sand required for the concrete mixer. The materials from the hopper are dumped into the loading hopper of the mixer, which has a 1½ yard capacity. The cement is elevated to the mixer from a platform which is alongside the railway on which the cement cars are spotted. The mixer is elevated so as to allow motor trucks to drive under a discharge spout which is mechanically operated. The trucks have a capacity of 1½ yards. The capacity of the plant is 375 yards.

The quarries receiving no appropriation from the city must take care of their own operating expenses through their sales. The management of the department as is also the waterworks, building inspection, plumbing, sewer, streets, machine shops and asphalt plant are directly under the city engineer, who alone is responsible to the city council.

New Incorporations

H. H. McKee & Sons, Inc., New York City, were recently incorporated for $200,000 to produce sand, clay, minerals, etc., by F. A. Huck, 254 Echo Place, Bronx, New York City.

Hamburg Ridge Lime Co., Inc., Dover, Del., was recently incorporated for $100,000 to produce limestone, by Cooper & Cooper, Dover.

Dayton Bedford Stone Co., Wilmington, Del., was incorporated for $560,000 by S. L. Mackey of Wilmington.

Yosemite Portland Cement Corp., New York, was recently incorporated for $1,650,000. (U. S. Corp. Co.)

Cambridge Sand & Gravel Co., Boston, Mass., was incorporated for $500,000 preferred stock ($100 par) and 5,000 shares no par common stock.

The Ideal Cement Co. of Denver, Colo., has been incorporated to engage in the manufacture of cement in Morgan County. Capital stock consists of 1,000 shares, no nominal or par value. R. R. Dorland, Devils Slide, appointed process attorney.

Farmer's Marl Lime Co., Inc., Salem, Va., has been incorporated for $10,000 to $50,000, to mine, quarry, smelt and refine marl, ores, metals and minerals of all kinds. J. P. Saul, Jr., president; E. H. Saul, secretary, and M. V. Little, all of Salem.

Alfred Sand & Gravel Corp., Hornell, N. Y., was recently incorporated for $300,000, by F. W. Sterrett, W. J. Schwiger, W. S. Calhoun.

The Mundy Corp., Wilmington, Del., was recently incorporated to quarry and excavate stone or rock; capital $1,000,000.

Benedict Stone, Inc., Wilmington, Del., has been incorporated to quarry, refine, dress, prepare for market and deal in stone, limestone, lime, marble and granite. Capital $1,200,000.

Morgan Sand and Gravel Co., Brooklyn, N. Y., has been incorporated for $50,000 to $100,000.

Superior Portland Cement Co., Seattle, Wash., has increased its capital stock from $2,000,000 to $3,000,000.

The Liberty Granite Co. of St. Cloud, Minn., formerly a partnership, recently filed papers to change the business to the corporate form as a better basis for an expansion program to be instituted.

Wyoming Valley Cement Products Co., Wilkesbarre, Pa., was recently incorporated for $6,000, by Vincenzo Pierdominici.

H. C. Rohrman Coal Co., Inc., Boston, Mass., was recently incorporated for $20,000 to deal in cement, stone, lumber, and fuel, by Rachel L. M. Rohrman and H. Wray Rohrman of Winchester and Mildred C. Roche of West Somerville.

The Yanks Made Their Own Cement

Written Expressly for PIT AND QUARRY by DICK SMITH

THE armies engaged in the World War needed many supplies never mentioned in press dispatches. Forges, railroad ties and carbon paper were as necessary in their own way as machine guns and gas masks. Among the major requirements of the great machines of conflict was cement; cement for concrete bases for great, long range artillery; cement for hospital foundations; cement to help build fortifications and Divisional Headquarter dugouts. The Germans had their 80 or more Portland Cement Mills working overtime so the famous "Officer's Row" streets of the Argonne and the Hindenberg line might be constructed, and the Big Berthas mounted in the tangled forests where no Allied Army aviator could discover them.

The Allies were short of this basic material when America came in. So our alert Engineering Corps saw the need of great quantities of cement in rapid order. The A. E. F. constructed by wholesale all the way back to the seaports; they built a new United States in lumber, galvanized iron and concrete all over France.

Now cement is no cargo to clutter up sea going bottoms in time of war when shipping space is precious. The material is too heavy, bulky, hard to handle and is subject to dampness. It was cheaper, by far, to haul coal (almost unobtainable in France then); so America sent over coal, and it made the power to operate eight Portland Cement mills in France which were manned by American troops.

The A. E. F. started taking over mills at least a year before the armistice. Engineers, recruited from various regiments for their knowledge of cement making or quarrying, and huskies, who might learn, were gathered together and sent as special companies to these mills which were, for the most part, in Southern and Western France.

Before long the hoppers were humming in a way that amazed the methodical French workmen. 'Sacre Bleu! these Yankees were crazy. Did they intend to build a high wall between the fighting armies? Two thousand barrel capacity mills which had never been worked to capacity before were doubling their output. The Americans were working two or three shifts; the thunder of the crushers resounded all night long and kept the good villagers awake. Still, these big westerners had zeal enough left after their labors to arouse the towns on Saturday nights.

Our Engineers, coming over to fight and remaining to make cement, found many difficulties and new problems to meet; French methods were different, and the old timers were loath to change. They couldn't work with our men very well. But the Portland mills, operated by Americans for a year, have never been the same since. There is something stirring there today. One superintendent told me sadly, "Ah, we have lost bolts and screws of an antiquity —the Americans are so careless. And they break everything. But they do get much done."

In March, 1919, I spent several weeks at "La Babaone Portland Cement Cie" at Mortayne-sur-Loire which is about seventy miles from Bordeaux on the majestic River Gironde, and a dozen miles from the Bay of Biscay, on the Western coast of France. Mortayne, the village, is perched on a rocky eminence of limestone, and the workmen for La Babaone have blasted away at the knoll, which is surface outcropping (highly alumined and rapid-setting stuff by the way) until the town may topple in some morning. Mortayne, the port, is a sheltered little harbor leading to the tide affected river and has two good sized grist mills owned by the Mayor, who is a great person indeed and owns part of the cement mill too. "La Babaone" is the only up to date affair in the district, if you make it a matter of comparison. The rest of Mortayne hasn't changed in three hundred years—the cement mill in forty.

The position of the stone makes quarrying an easy problem. The Engineers brought in the steam shovel and this helped more. There is a little incline yet and of course the dinky cars were drawn by oxen. Pulleys took their place under American control, and electrical operation was planned. The little narrow gauge railroad, which is the only steam

transportation Mortayne may claim, creeps along the bluffs and up to the plant and expires with a sigh.

This narrow gauge is the champion goatgetter. It operates from Mortayne to the main line of the Paris and Orleans Railroad, a matter of five miles, and all these two score years the owners have paid for loading sacks and barrels of cement into these dinky cars and then re-loaded them into standard gauge cars again at the main line. It increased the already overwhelming transportation problem, but in the old days labor was cheap, and time was endless, and no one worried about efficiency.

It must be remembered that conditions are altogether different in Europe than they are here Acting in reverse ratio, coal is expensive and labor cheap. In the United States labor costs are high and coal comparatively reasonable. So the Europeans use the shaft kilns in most cases where bricket coal can be fed. They do not worry about installing first class transportation facilities and labor saving devices. But times are changing since the war. Our troops were industrial crusaders for Europe without realizing it.

Only the unexpected advent of the armistice upset the American plan to build standard gauge railroad from Mortayne to the main line. American railroad men had already laid 900 miles of yard, spur and passing track in France; they had built 1,000 warehouses, fifty docks and handled countless other large buildings and construction jobs.

So probably Mortayne is still using its narrow gauge. When I was there, operations had ceased and we cleaned the plant and took invoice and turned it back to its French owners after much discussion. Master Engineer Dow, who had been in active charge of the work, had remained after the cement company left, and five of us were detailed to aid him in clearing things up. We worked all day in the mill, cleaning boilers and flues and kilns, tightening pulleys and making mechanical readjustments. Then the owners wanted us to re-pile and count the 19,000 odd sacks of cement too! This was appalling, as we were walking guard around the mill as well. We received orders from headquarters to do this little job, but diplomacy still works. We gave the French Director all our "Bull Durham" and sugar and he agreed to accept our estimate of the sacks without re-piling, and took us into his house for a drink of "port" to bind the bargain.

The shop keepers of Mortayne were very blue. Why had the United States Army removed the cement company? They had been the best customers of all time. But the cement men were great lovers as well as workers, for eight brides went with them to America. Mortayne will always be closely associated with our country now.

Dow sold the coal to the British for $19 a ton, a very neat price for the low grade mine run the stuff was. And he ignored orders to demolish the three weather beaten barracks and sold them intact to the Mayor, thus enriching our government 600 francs (about $100 then). The Master Engineer had become close to this great man of the village by the simple method of the Mayor's daughter falling in love with the handsome American. That man might now be heir to the village if he had chosen to stay in France.

But the mills of Europe are losing their ancient methods, a member of the Portland Cement Association's committee, which attended the Centennial in England last summer, tells me. He says that in Germany, parts of France and Denmark, plants are being built with larger units and the additions to old plants are much better. Modern rotary kilns and grinders are evident. At Marseilles, the great Southern port of France, a new 3,000 barrel mill has just been finished and it is quite up-to-date. It is of the Danish type.

Best of all, the mill owners and operators are taking an increased interest in international and American methods. There is now a steady exchange of ideas. In Germany, post war conditions are evident, but the cement industry is firm. This exchange of ideas is going to prove invaluable. There are things our cement and quarry men may learn from Europe after all.

Germany now has between 90 and 100 Portland Cement Mills. The United States has only 140. The average cost of a new mill in Europe, typical of those being built now, is only about $1,500.00—far below the amount needed here to build a first class plant. So they are springing up. France is using much concrete in the war torn districts. She has about 35 plants in operation. England, the home of Portland Cement, can boast of 75 mills.

The Stewart Sand and Gravel Plant Small But Modern

Contracting Company Marketing Good Washed Product Producing 300 Cubic Yards Daily at Owasso, Michigan

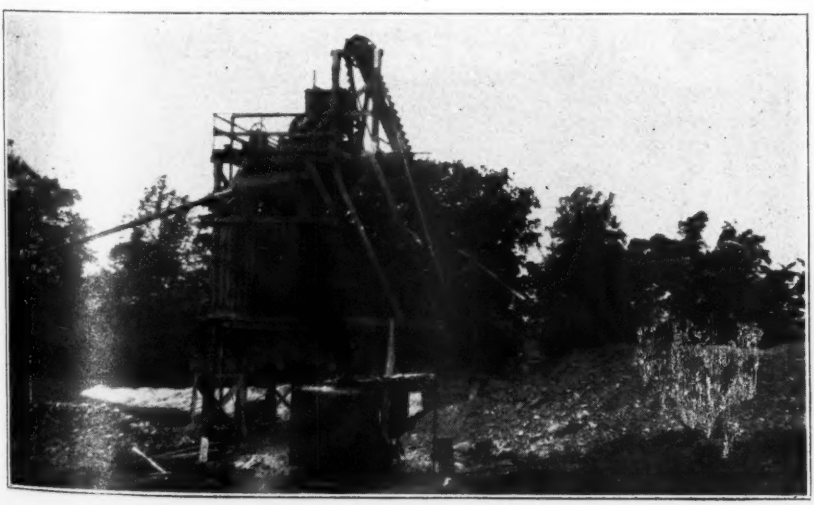
THE demand for sand and gravel in and around Owasso, Michigan, led the J. C. Stewart Company into operating a plant. The fact that this company also needed a considerable quantity in their own work, which is foundation and paving work, did not prove a handicap either. The plan of operation is to produce all the aggregate the company needs and in addition all that the commercial vicinity will take.

A bank of gravel 4½ miles southwest of the city about 25 feet deep with a top waste of approximately 6 feet was selected. At first it did not look as if it would be profitable to handle so much stripping, but by using an Erie type B shovel and 2½ ton Union trucks, it was possible to handle the overburden at a low enough cost to make it profitable. A plot of ground about 400 feet square was stripped. This has given enough volume of sand and gravel to meet the requirements for two years.

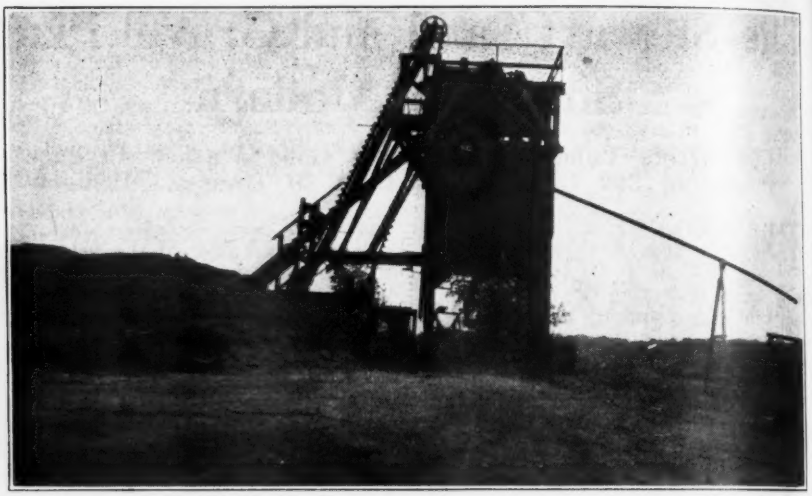
The overburden has been hauled away to the low ground adjacent to the pit. Next year the party who owns this low ground or farm will cultivate that part of the field where the dirt has been dumped. This he has never been able to do before.

The material is transported from the pit by a ⅞ cubic yard Green drag scraper attached to a Novo 40 H.P. double drum hoist, and is deposited in a receiving hopper with a capacity of about 20 yards. The receiving hopper is built funnel shape and is fed from the bottom of the hopper by a Telsmith plate feeder onto a grizzly screen. That part of the material which goes through the screen drops into a bucket elevator and the oversize material goes into an Acme number 10 jaw crusher from which point it is discharged into the same bucket elevator as the small material, at a point lower down.

At the out end of the cable line, two A frames about sixty feet apart with a bridle cable extending between them are used. This gives considerable more area to work over than if only one A frame was used. All of the material is discharged into the same



View of Screening and Washing Plant.

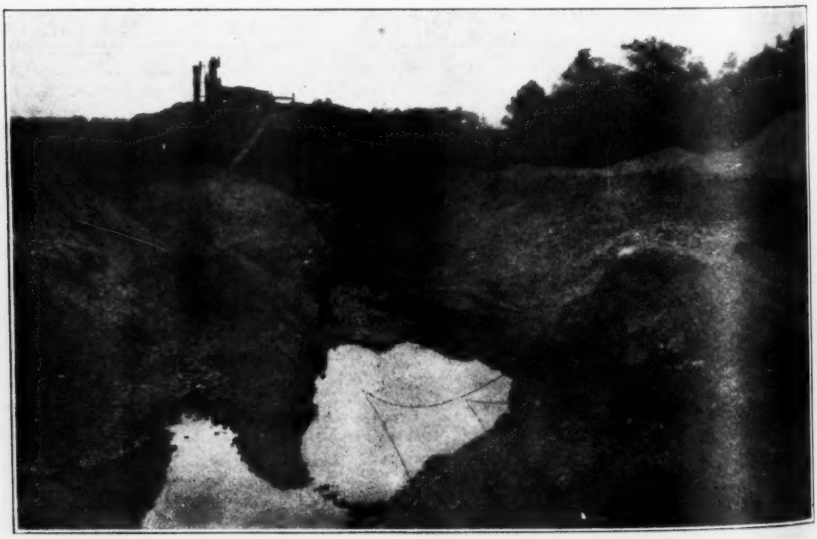


View Showing Loading Facilities.

elevator, therefore requiring only one elevator to the entire plant.

The material is then discharged from the bucket elevator into a receiving box three feet square at the top of the plant, and is washed from this box into the scrubbing section of the screen through a 12x12 inch flat trough by a 3 inch stream of water. The material then passes from the scrubbing section to the sand screen, and the sand and water then discharges into a trough, which carries it to a number 5 and number 6 Telsmith and settling tanks, from which point the sand discharges into the bins, and the dirt and water passes out through a waste flume.

As the sand and water is separated from the stone, the stone passes to the stone screens and is here washed by a series of four 1½ inch pipes flattened at the discharge end, so as to make a spray, and washes the dirt



A General View of Pit and Plant.

and muddy water from the pebbles. The pebbles are then screened into three different sizes, varying from ¼ of an inch to 2½ inches in size. That part of the stone which is too large to pass the screen, then passes into a rejection chute which carries it back to the crusher at the bottom of the plant. The screens are all Telsmith of 30 inch diameter.

The entire plant is driven by an EF 40 H.P. Novo four cylinder engine, which is belt connected to the crusher. The power is transmitted from the crusher to the other parts of the plant by counter shafts and belts. The water is furnished by a 4-inch Fairbanks Morse centrifugal pump driven by a Ford engine, and is pumped a horizontal distance of 775 feet and a vertical distance of 50 feet.

The plant for crushing, screening and washing was built by the J. C. Stewart Company. The bins are of corrugated steel of a capacity of 140 cubic yards and were procured from Harris Brothers Company of Chicago, Illinois. The conveying and screening equipment was purchased from the Smith Engineering Company of Milwaukee, Wisconsin. The capacity of the plant is approximately 30 cubic yards per hour.

This last season, the hoisting outfit has been located on the ground, about eight feet below the top elevator of the receiving hopper, but it has been found that this is not entirely satisfactory for two reasons: (1) That considerable more wear on the cable and sheaves occur than would if it was located at the same elevation as the sheaves and (2) That the operator of the hoisting outfit can not see the bucket at all times. The J. C. Stewart Company are arranging to build a platform for the hoisting outfit at the same elevation as the sheaves.

L. J. Hewes Resigns

The very many friends of Mr. L. J. Hewes, for eight years manager of the district office of the Traylor Eng. & Mfg. Co., 1414 Fisher Building, Chicago, Illinois, will regret to learn that he has tendered his resignation, effective Jan. 1, 1925.

Mr. Hewes for nearly forty years, has been actively and prominently identified with the design and sale of crushing and mining machinery and has won an unusual measure of success in this line of endeavor.

He has ever been an earnest advocate of the principle that a business man should take his leisure at an age when he still has the physical capacity to keenly enjoy life and he feels that his strenuous business career now entitles him to devote his time to recreation.

Mr. Benard Haislip, for a number of years assistant to Mr. Hewes. has been appointed District Manager to succeed him.

A View Showing Shovel Removing Over Burden.

N. C. S. A. Program

THE general plan of the National Crushed Stone Convention to be held in Cincinnati, January 12, 13, 14 and 15th, will be as follows:

Monday, January 12, 1925

General Session, 10 a. m. to 12:30 p. m.

John J. Sloan, President, presiding.

Greetindg from Cincinnati — The Mayor Response—speaker to be selected.

Appointment of following Convention Committees:

1. Auditing. 2. Nominations. 3. Resolution. 4. Rules and procedure.

Five minute reports of Directors on condition and out-look of the Crushed Stone industry.

Committee Luncheons, 1 p. m. to 2:30 p. m.

General Session, 2:30 p. m. to 3:30 p. m.

Director's reports continued.

General business and round table.

Exposition, open from 3:30 p. m. to 6 p. m.

The Evening Session

Motion Pictures 8 p. m. to 9 p. m.

Smoker and entertainment.

Tuesday, January 13—A. M.

8 a. m. to 10 a. m.—Exposition open

10 a. m. to 12:30 p. m.—General Session.

10 to 10:30—Address Hon. L. A. Boulay, Ohio State Highway Director.

10:30 to 11—Railroad and Immigration Committee's Report on Kelly Tariff and Slag Rate Cases, by B. D. Pierce, Jr., Chairman.

11 to 11:30—Address by George E. Schaffer, Rochester, N. Y., "The Need and Usefulness of Local Associations." Discussion—H. B. Allen, Philadelphia; J. F. Schroeder, Iowa; George Balfe, Indiana; Allen Patterson, Ohio.

11:30 to 12 M.—General Business.

12 to 12:30—Address, Colonel Green, State Director Public Works, Albany, N. Y.

1 p. m. to 3 p. m.—Group Luncheons.

3 p. m. to 6 p. m.—Exposition Open.

6:30 p. m.—The Banquet

Speakers Suggested,

Ex Senator Albert J. Beveridge, Indianapolis, Ind.

Geo. Otis Smith, Director U. S. Geological Survey, Washington, D. C.

P. E. Crowley, New York Central Lines.

General Atterbury, Vice President, Penna. Railroad.

Hon. Myers Y. Cooper, Home Builder, Cincinnati.

Wednesday, January 14, 1924

General Session—10 a. m.

10:00 to 10:30—Mr. Briggs, Internal Revenue Department, Washington, D. C.

10:30 to 11:00—General Business.

11:00 to 11:30—Mr. Nubert, Engineer Maintenance of Way, New York Central Lines.

11:30 to 12:30—Special Committee Reports.

Recess.

1:00 p. m. to 3:00 p. m.—Group Luncheons (Geographical Divisions).

3:00 to 6:00 p. m.—Exposition open.

8:15—Theatre Party.

Thursday, January 15

General Session—10 a. m.

10:00 to 11:00—General Session, Association Business and Election of Officers.

11:00 to 11:30—Address, "The Virtues and Value of Coal," R. B. Graham.

11:30 to 12:00—Unfinished Business.

Recess.

1:00 p. m.—Get-together Luncheon.

3:00 p. m.—Directors Meeting.

Committe eMeetings.

Group Meetings

The following Group Meetings will be held during N. C. S. A. Convention:

Ballast—John Rice, Chairman.

Agricultural Lime and Limestone—E. M. Lamkin, Chairman.

Concrete Aggregate—O. P. Chamberlin, Chairman.

Sales and Research—H. H. Brandon, Chairman.

Highways—H. M. Sharp, Chairman.

Each Group will hold two or three afternoon sessions—Each Chairman is building a good program and securing eminent speakers on practical topics, intended to develop the greater use of stone and its superior merits over other materials.

Evening Pastime

Three major events will feature the evenings of the Cincinnati Convention:

Monday—The Smoker.

Tuesday—The Banquet.

Wednesday—The Theatre Party.

The Economics of Rate Making

Written Expressly for PIT AND QUARRY by JOSEPH H. DONNELL*

V

This is the fifth of the series of articles by Mr. Donnell under the title of Economics of Rate Making. The sixth and last article will appear in the January 15th number. The first article appeared in the November 1st number.

Elements affecting the carrier's cost of service, the value of service, the volume movement of freight, handling and risk, railway competition, water competition and commercial competition were discussed in the preceding articles.

This and the sixth article will deal with the legal factors of rate making.

—Editor.

THE importance of transportation to the individual and to commercial industry was stressed in the opening chapter of these articles. Without transportation industry could not progress. The farmer, the manufacturer, the jobber, the individual are all dependent upon transportation for their very existence. Transportation may be said to be the keystone of our economic structure. The railroads themselves comprise a mighty industry. They give employment to a vast number of people.

As the result of the intimate manner in which transportation is related to all of the branches of industry and to the welfare of individuals, the Federal Government as represented by Congress has recognized that the public utility corporations such as railroads should operate under governmental regulation in order that the public interest may best be served. The railroads are in the last analysis public service institutions, and therefore servants of the public. In some countries of Continental Europe the railroads are owned and operated by the Government of those countries with varying degrees of success. On the whole government operation of railroads has been shown to be inefficient, wasteful and not conducive to the most efficient operation. The railroads of the United States have always been privately owned and operated, with the brief exception of the period of Government control during the war when they were operated, but not owned, by the Federal Government through the agency of the United Railroad Administration.

For many years the railroads of this country were left comparatively free to do as they pleased in the matter of operation and in their relations with the public. However, certain abuses came into being which ultimately necessitated government regulation. Thus in 1887 the Act to Regulate Commerce was enacted. Until the enactment of this legislation the railroads had been subject only to such restrictions as might be imposed by court decisions and the common law. In a previous installment the practice of rebating was discussed. This practice consisted of a carrier refunding to a preferred shipper a portion of the transportation charges paid upon his shipments. It was explained how this worked to the detriment of the smaller shippers and smaller roads in favor of the strong shippers and the stronger roads. This was perhaps the principal abuse practiced prior to the enactment of the Act to Regulate Commerce since known as the Interstate Commerce Act.

A discussion of this practice by the United States Supreme Court is very illuminative of the condition which ultimately resulted in the passage of the Interstate Commerce Act. The Supreme Court said, "It may be well to advert to the causes which induced its enactment. They chiefly grew out of the use of railroads as the principal modern instrumentality of Commerce. While shippers of merchandise are under no legal necessity to use the railroads, practically they are. A demand for speedy and prompt movement veritably forbids the employment of slow and old fashioned methods of transportation, at least in the case of the more valuable articles of traffic. At the same time the immense outlay of money required to build and maintain railroads and the necessity of resorting to the right of

*Traffic Counselor, La Salle Extension University. Editor Trade and Transportation Bulletin, Formerly Member Rate Board of Swift & Co., and Rate Expert of Interstate Commerce Commission.

eminent domain in securing the rights of way in effect disable individual merchants and shippers from themselves providing such means of carriage from the very nature of the case; therefore, railroads are monopolies, and the evils that usually accompany monopolies soon began to show themselves and were the cause of loud complaint. The companies owning the railroads were charged and sometimes truthfully with making unjust discrimination between shippers and localities, with making secret agreements, some to the detriment of other patrons, and with making pools or combinations with each other leading to the oppression of entire communities.

Some of these mischiefs were partially remedied by special provisions inserted in the charters of the companies, and by general enactment by the several states, such as clauses restricting the rates of toll, and forbidding railroad companies from becoming concerned in the sale or production of articles carried, and from making unjust preferences. Relief to some extent was likewise found in the actions of the court in enforcing the principles of the common law applicable to common carriers, but particularly that one which requires uniformity of treatment in like conditions of service.

As, however, the powers of the state were restricted to their own territories and did not enable them efficiently to control the management of great corporations whose roads extend through the entire country, there was a general demand that Congress in the exercise of its plenary power over the subject of foreign and interstate commerce should deal with the evil complained of by a general enactment and the statute in question was the result.

Of necessity the Interstate Commerce Act has had to be amended from time to time in order to keep pace with developments in the transportation field and to provide adequate remedies for evils which have been found to exist. Our discussion of the Act will be confined to those phases of it which have a tangible bearing upon freight rates. Among the amendments to the transportation legislation originally passed in 1887 are the Elkins Act, the Hepburn Act, The Mann-Elkins Act, Transportation Act of 1920, the Cummins Amendment, the Carmack Amendment, etc.

The principal provision of the Interstate Commerce Act with which we are concerned is that one which created the Interstate Commerce Commission and delegated to that body the duty of executing and enforcing the provisions of the act. The original act of 1887 created the Commission, and its powers have from time to time been increased and broadened by amendatory acts. All rates, according to the Act, must be just and reasonable, and it is the duty of the Interstate Commerce Commission to enforce this provision. The Commission must see that all rates are just and reasonable within the meaning contemplated by the Act. The carriers are permitted to initiate their own rates, but it devolves upon the Commission to say whether such rates may be maintained or continued in force. The Traffic Managers of the railways therefore, in establishing their rates must constantly bear in mind that they are subject to the approval of the Commission and that if their rates are not just and reasonable they will in all probability be required to cancel them, if indeed they are not suspended before they become effective.

For practical purposes it may be said that the Commission has the last say in the matter of rate making. There are however, certain rates which are non-compensatory and are therefore equivalent to a confiscation of the carrier's property. Such rates are in violation of the provisions of the constitution of the United States and therefore unconstitutional. The Courts of the land may review such rates and are authorized to prescribe remedial action. In this case it then devolves upon the Interstate Commerce Commission to say what rate should apply. The powers of the Interstate Commerce Commission are very broad, yet in the discretion of Congress as reflected in the Interstate Commerce Act, the Commission has been specifically instructed to do certain things, specifically to refrain from doing other things and to use its discretion in a great many other matters.

The Interstate Commerce Act places at the service of the Interstate Commerce Commission the legal machinery of the United States Government. The Commission may invoke the aid of the Courts in enforcing its decision. For example Section 12 of the Act reads in part, "Upon the re-

quest of the Commission it shall be the duty of any district attorney of the United States to whom the Commission may apply, to institute in the proper Court and to prosecute under the direction of the Attorney General of the United States all necessary proceedings for the enforcement of the provisions of this Act and for the punishment of all violations thereof, and the cost and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States, and for the purposes of this Act the Commission shall have power to require by subpoena the attendance and testimony of witnesses and the production of all books, papers, carrier's contracts, agreements and documents relating to any matter under investigation.

This part of the Act further says, "And any of the Circuit Courts in the United States within the jurisdiction of which such inquiry is carried on may in case of contumacy or refusal to obey a subpoena issued to any common carrier subject to the provisions of this Act or other persons, issue an order requiring such common carrier or other person to appear before said commission and produce books and papers if so ordered, and give evidence touching the matter in question and any failure to obey such order of the Court may be punished by such court as a contempt thereof."

The Commission has been empowered to require that every common carrier subject to the Act shall file with it copies of all contracts, agreements or arrangements with other common carriers with relation to any traffic affected by the provisions of this Act to which it may be a party.

Since the transportation Act of 1920 was passed which authorized the Interstate Commerce Commission to allow the carriers to charge rates which would net them earnings as nearly as possible to from 5½ to 6% on the valuation of their properties, the question of valuations and of the methods of arriving at valuations has taken on a very important significance with relation to the making of freight rates. Section 12 of the Act empowers the Interstate Commerce Commission to prescribe what charges shall be included for depreciation in value of the properties and the percentages which shall obtain in determining the amount of depreciation. Thus the Act says, "The Commission shall as soon as practicable prescribe for carriers subject to this Act, the classes of property for which depreciation charges may properly be included under operating expenses, and the percentage of depreciation which shall be charged with respect to each of such classes of properties, classifying the carriers as it may seem proper for this purpose. The Commission may when it deems necessary modify the classes and the percentages so prescribed."

The Interstate Commerce Commission may fix maximum, minimum or precise rates. This power is conferred upon it by Section 15 of the Interstate Commerce Act. This Section of the Act is a very important one. It reads as follows, "That whenever at the full hearing upon a complaint made as prescribed in Section 13 of this Act or after full hearing under an order for investigation and hearing made by the Commission on its own initiative either on extension of an impending complaint or without any complaint whatever, the Commission shall be of opinion that any individual or joint fare, rate or charge whatsoever demanded, charged or collected by any common carrier or carriers subject to this Act for the transportation of persons or properties or for the transmission of messages as defined in the first section of this Act or that any individual or joint classification, regulation, or practice whatsover of such carrier or carriers, subject to the provisions of this Act, is or will be unjust or unreasonable, or unjustly discriminatory or unduly preferential or prejudicial or otherwise in violation of any of the provisions of this Act, the Commission is hereby authorized and empowered to determine and prescribe what will be the just and reasonable individual or joint rates, fares or charges to be thereafter observed in such case, or the maximum or minimum to be charged or in the case of a through route where one of the carriers is a water-line, the maximum rate, fares and charges applicable thereto and what individual or joint classification, regulation or practice is or will be just, fair and reasonable to be thereafter followed and to make an order that the carrier or carriers shall cease and desist from such violations to the extent to which the Commission finds that the same does or will exist."

We have explained in a previous

chapter the importance which water competition bears to the establishment of freight rates. It is within the province of the Interstate Commerce Commission to determine questions of facts relating to the competition or possibilities of competition between rail and water lines. This authority is conferred upon the Commission by Section 5 of the Interstate Commerce Act. "Jurisdiction is hereby conferred on the Interstate Commerce Commission to determine questions of fact as to the competition or possibility of competition at the full hearing on the application of any railroad company or any other carrier."

Congress did not vest in the Commission authority or jurisdication over rates applicable wholly to water. Although the Commission is without jurisdiction over such rates, however, the Act did convey jurisdiction to the Interstate Commerce Commission over traffic moving jointly by rail and water under joint agreement. Thus the Commission may be said to have jurisdiction over the transportation of persons or property wholly by railroad or partly by railroad and partly by water, when both are used under a common control, management or arrangement for a continuous carriage or shipment. Certain excerpts from Section 6 of the Interstate Commerce Act are very informative as to the status of the Interstate Commerce Commission in connection with rates via water. For example, this section of the Act says in part, "When property may be or is transported from point to point in the United States by rail and water through the Panama Canal or otherwise, the transportation being by common carrier or carriers and not entirely within the limits of a single state, the Interstate Commerce Commission shall have jurisdiction of such transportation and of the carrires, both by rail and by water which may or do engage in the same in the following particulars, in addition to the jurisdiction given by the Act to regulate commerce as amended June 18th, 1910.

"To establish through routes and maximum joint rates between and over such rail and water lines and to determine all the terms and conditions under which such lines shall be operated in the handling of the traffic and freight.

To establish proportional rates or maximum or minimum, or maximum and minimum proportional rates by rail to and from the ports to which the traffic is brought or from which it is reviewed by the water carrier and to determine what traffic and in connection with what vessels and upon what terms and conditions such rates apply. By proportional rates are meant those which differ from the corresponding local rates to and from the ports and which apply only to traffic which has been brought to the port or is carried from the port by a common carrier by water."

Section 15 of the Act says in part: "Nor shall the Commission have the right to establish any routes, classifications or practice, or any rates, fare or charge, when the transportation is wholly by water and any transportation by water affected by this Act shall be subject to the laws and regulations applicable to transportation by water."

Another Section of Section 15 says, "The Commission shall whenever deemed by it to be necessary or desirable in the public interests after full hearing upon complaint or upon its own initiative without a complaint, establish through routes, joint classifications and joint rates, fares or charges applicable to the transportation of passengers or property or the maximum or minimum to be charged, or in the case of a through route where one of the carriers is a water line, the maximum rate, fares and charges, applicable thereto. The divisions of such rates, fares or charges as hereinafter provided, and the terms and conditions under which such through routes shall be operated and this provision except as herein otherwise provided, shall apply only when one of the carriers is a waterline."

The Commission while not having jurisdiction over water rates may nevertheless exercise a certain amount of influence upon them in certain cases, where it is found that the rail rates are detrimental to water borne traffic. In such cases the United States Shipping Board may complain to the Interstate Commerce Commission and the Commission will take such action as it may be empowered to take and considered proper under the existing laws. The following excerpt from the Merchant Marine Act of 1920 covers this point, as follows, "If after such investigation the Board (United States Shipping

Board) shall be of the opinion that rates, charges, rules or regulations of common carriers by rail, subject to the jurisdiction of the Interstate Commission are detrimental to the declared object of this section or that new rates, charges or regulations or additional port terminal facilities or affirmative action on the part of such carriers by rail is necessary to promote the object of this Section, the Board may submit its findings to the Interstate Commerce Commission for such action as such commission may consider proper under the existing laws."

When new rates are filed by the carriers with the Commission, the Commission may investigate the propriety of such rates, may issue orders with respect to such rates, and if they are found to be unreasonable may order the cancellation of the tariffs in which thy are published. As a precedent to this cancellation the Commission is required to conduct a full and complete hearing, at which the carriers and other interested parties may give testimony regarding the rates in question. During such periods of hearing the rates may be ordered suspended until the hearings are completed.

The Interstate Commerce Act also provides that the burden of proof of reasonableness of increased rates shall be upon the carrier, and that section of the Act making this provision, reads as follows: "At any hearing involving a rate, fare or charge, increased after Jan. 1st, 1910, or of a rate, fare or charge, sought to be increased after the passage of this Act, the burden of proof to show that the increased rate, fare or charge, or proposed increased rate, fare or charge, or proposed increased rate, fare or charge, is just and reasonable, shall be upon the carrier, and the Commission shall give to the hearing and decision of such questions, preference over all other questions pending before it, and decide the same as speedily as possible."

We now come to Section 15 A of the Interstate Commerce Act, which came about as a result of the passage of the transportation Act of 1920. This section is commonly called the rate making section, and upon it depends in large measure, the rates the carriers are permitted to charge at the present time.

Because of the importance of this section, we shall quote it at some length. This section of the Act specifically confers upon the Commission "The power to initiate, modify and establish or adjust rates, so that carriers as a whole or as a whole in each of such rate groups or territories as the Commission may from time to time designate, will under efficient, honest and economical management, and reasonable expenditures for maintenance of ways, structures, and equipment earn an aggregate, net railway operating income equal as nearly as may be to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation, provided that the Commission shall have reasonable latitude to modify or adjust any particular rate which it may find to be unjust or unreasonable and to prescribe different rates for different sections of the country.

It further provides "The Commission shall from time to time determine and make public what percentage of such aggregate property value constitutes a fair return thereon and such percentage shall be uniform for all rate groups or territories which may be designated by the Commission. In making such determination it shall give due consideration among other things to the transportation needs of the country, and the necessity under honest, efficient and economical management of existing transportation facilities of enlarging such facilities in order to provide the people of the United States with adequate transportation, provided that during the two years, beginning March 1st, 1920, the Commission shall take as such fair return a sum equal to 5½% of such aggregate value, but may in its discretion add thereto a sum not exceeding one half of one per cent of such aggregate values to make provisions in whole or in part for improvement, betterment or equipment which according to the Accounting System prescribed by the Commission are chargeable to capital account."

Paragraph 4 of Section 15 A of the Act empowers the Commission to determine what the aggregate railway values may be in order that it may intelligently prescribe the correct rates.

A discussion of Section 15 A would be incomplete without mention of the so-called "Recapture clause." Thus Paragraphs 5 and 6 of the Interstate

Commrece Act (Section 15 A) read as follows, "Inasmuch as it is impossible, without regulation and control in the interest of the Commerce of the United States considered as a whole, to establish uniform rates upon competitive traffic which will adequately sustain all the carriers which are engaged in such traffic and which are indispensible to the communities to which they render the service of transportation without enabling some of such carriers to receive a net railway operating income substantially and unreasonably in excess of a fair return upon the value of their railway property held for and used in the service of transportation, it is hereby declared, that any carrier which receives such an income so in excess of a fair return shall hold such part of the excess as hereinafter prescribed as trustee for and shall pay it to the United States."

Section 6, "If under the provisions of this section any carrier receives for any year a net railway operating income in excess of 6% of the value of the railway property, held for and used by it in the service of transportation, one half of such excess shall be placed in a reserve fund established and maintained by such carriers, and the remaining one half thereof shall within the first four months following the close of the period for which such computation is made, be recoverable by and paid to the Commission for the purpose of establishing and maintaining a general railroad contingent fund as hereinafter described. For the purposes of this paragraph, the value of the railway property and the net railway operating income of a group of carriers which the Commission finds are under common control and management and are operated as a single system, shall be computed for the System as a whole, irrespective of the separate ownership and the accounting returns of the various parts of such a System."

Following the enactment of these provisions into law the Commission allowed the carriers throughout the country to increase their rates upon a horizontal percentage basis. These increases were based upon allowances of 40% in Official Classification territory, 25% in southeastern territory, 35% in territory west of the Mississippi River embracing intermountain territory and 25% on the Pacific coast. Through rates applicable interterritorially between the respective groups were to be increased 33 1/3%.

It is quite apparent from the foregoing that in the year 1921 there was a drifting away from the value of service principle towards the cost of service principle, because of the enactment of Section 15 A into law, and the consequent effort on the part of the Commission to base rates throughout the country at such figures as would enable the carriers to receive a reasonable net income based upon the values of their properties, or in other words, a fair return over and above the cost of the service.

Section 2 of the Act specifically prohibits unjust discrimination in rates. It says, "That if any common carrier subject to the provisions of this Act shall directly or indirectly by any special rate, rebate, drawback or other device charge, demand, collect or receive from any person or persons a greater or less compensation for any service rendered or to be rendered in the transportation of passengers or property or the transportation of intelligence, subject to the provisions of this Act than it charges, demands, collects or receives from any other person or persons for doing for him or them, a like and contemporaneous service in the transportation or transmission of a like traffic or message under substantially similar circumstances and conditions, such common carriers shall be deemed guilty of unjust discrimination. It is hereby prohibited and declared to be unlawful."

It is similarly prescribed in Section 3 that the carrier shall not be allowed to confer any undue or unwarranted or unreasonable preference or advantage to any particular person, company, firm, corporation or locality, to the detriment of some other person, company, firm, corporation or locality.

Section 1 of the Elkins Act, also deals with discriminatory practices and prescribes penalties for infractions of the laws relative thereto. There are other miscellaneous and specific provisions with regard to rates, contained in the Interstate Commerce Act, which we might mention here. Thus in connection with released rates which to some extent have the effect of limiting the carrier's liability in proportion to the rates paid, the Act, Section 20, Paragraph 11 which is known as the Second Cummins Amendment, provides that carriers shall be liable for

full loss or damage incurred by shipment while in their possession, notwithstanding the stipulations on the Bills of Lading to the contrary.

The second half of Paragraph 11 of Section 20 of the Act excepts from this provision certain commodities which are dependent upon declared value for the rates assessed thereon. These commodities include live stock of an extraordinary character, such as blooded stock or race horses, furniture and household goods, as well as other commodities which by authority of the Interstate Commerce Commission are shipped under released rates. Paragraph 11 also stipulates that the establishment of released rates upon such commodities may only be practiced under specific authority given expressly by the Interstate Commerce Commission, upon specifically designated commodities.

The fourth section of the Interstate Commerce Act is a very important one in its bearing both on individual rates and rate structures throughout the entire country. This section of the Act embodies the so called "long and short haul clause" and provides "that it shall be unlawful for any common carrier subject to the provisions of the Act to charge or receive any greater compensation in the aggregate for the transportation of passengers, or of like kind of property for a shorter than for a longer distance over the same line or route in the same direction, the shorter being included within the longer distance, or to charge any greater compensation as a through rate than the aggregate or the intermediate rates subject to the provision of the Act."

It also says, "This shall not be construed as authorizing any common carrier within the terms of this Act to charge or receive as great compensation for a shorter as for a longer distance, provided that upon application to the Commission such common carrier may in special cases after an investigation, be authorized by the Commission to charge less for longer than for shorter distances for the transportation of passengers or property and the Commission may from time to time prescribe the extent to which such designated common carrier may be relieved from the operation of this section, but in exercising the authority conferred upon it in this proviso the Commission shall not permit the establishment of any charge to or from the more distant points than is not reasonably compensatory for the service performed, and if a circuitous rail line or route is because of such circuity granted authority to meet the charges of a more direct line or route, to or from competitive points, and to maintain higher charges to or from intermediate points on its line, the authority shall not include intermediate points as to which the haul of the petitioning line or route is not longer than that of the direct line or route between the competitive point, and no such authorization shall be granted on account of merely potential water competition, not actually in existence, and provided further that rates, fares or charges existing at the time of the passage of this amendatory act by virtue of orders of the Commission or as to which application has theretofore been filed with the Commission and not yet acted upon, shall not be required to be changed by reason of the provisions of this section until the further order of, or a determination by the Commission."

Paragraph 2 of Section 4 provides that whenever a rail carrier in competition with a water route reduces its rates to or from competitive points, it shall not thereafter be permitted to increase such rate until, after a full hearing by the Commission, it is found that such proposed increases rest upon changed conditions other than the elimination of water competition.

Since the decision of the United States Supreme Court in the Shreveport case, and the Transportation Act of 1920, the Commission has authority to prescribe the adjustment of intra-state rates when they are found to constitute a discrimination against inter-state traffic. Section 4 of the Act covers this matter in the following language: "Whenever, in any such investigation the Commission at the full hearing finds that any such rates, fare, charge or classification, regulation, or practice causes any undue or unreasonable advantage, preference or prejudice as between persons or localities in intra-state commerce on one hand and inter-state or foreign commerce on the other hand, or any undue, unreasonable or unjust discrimination against interstate or foreign commerce, which is hereby forbidden and declared to be unlawful, it shall prescribe the rates, fare or charge, or the maximum or minimum, or maximum and minimum, therefore, thereafter to be charged, and the

classification, regulation or practice thereafter to be observed, in such manner as in its judgment will remove such advantage, preference, prejudice or discrimination. Such rates, fares, charges, classifications, regulations and practices, shall be observed while in effect by the carriers, parties to such proceedings effected thereby, the law of any state, or the decision or order of any state authority to the contrary notwithstanding."

Section 14, paragraph 3, specifies that whenever in any investigation under the provisions of the Act or in any investigation instituted upon petition of the carrier concerned, which petition is authorized by the Act to be filed, there shall be brought in issue, any rates, fare, charge, classification, regulation or practice, made or imposed by authority of any state, the Commission before proceeding to hear and dispose of such issue shall cause the state or states interested to be notified of the proceedings.

The Commission is also authorized to avail itself of the co-operation, services, records and facilities of such state authorities in the enforcement of any provision of the Act.

Most of the points heretofore touched upon in this chapter on legal factors have to do with mandatory provisions as contained in the Interstate Commerce Act. There are also certain precedents established as the result of court decisions which effect rate making. Necessarily, a lot of court decisions have been based upon the Interstate Commerce Act. To briefly sum up certain points which must be borne in mind when establishing rates, in order that they may comply with Court decisions, let us consider the following: 1. The carriers have the right to fix and initiate their own rates. 2. This right is conferred by the Act to Regulate Commerce, except in the case of rates which violate the provisions of the fourth section. 3. Rates published by the carriers must be available to all shippers. 4. The Interstate Commerce Commission must make a finding of unreasonableness based on evidence before altering a rate. 5. In the absence of evidence to the contrary there shall be a presumption of honest intent when the carriers raise their rates. 6. A state statute may not require the carriers to maintain non-compensatory rates, such a provision would be unconstitutional and void. 7. Changes in rates must be justified by the carrier. 8. The Court will grant relief in the case of rates which are shown to be arbitrary and unreasonable if such relief may not be secured through the medium of the Interstate Commerce Commission and the Court may declare illegal any rates which are in violation of the provisions of the Constitution, such as confiscatory and non-compensatory rates. 9. The Federal Government, (The Interstate Commerce Commission) may fix intrastate rates, when they are discriminatory against interstate traffic. 10. The power of the Interstate Commerce Commission to fix interstate rates is derived from the Interstate Commerce Act and rates fixed by the Commission which are not compensatory and therefore in violation of the constitution are subject to review by the Courts. 11. Rates resulting from contracts must be published and filed with the Interstate Commerce Commission in the same manner as other rates. They are likewise subject to government regulation. 12. The rights of shippers and carriers are reciprocal. 13. Carriers are entitled to a fair return upon their investment and all rates should reflect a reasonable value of service to the public as well as a margin above the cost of service. 14. Rates unreasonable, whether too high or too low are not permissible. 15. Reasonable compensation must obtain in all cases. 16. Carriers may not base their rates upon a shipper's prosperity. 17. In cases involving a conflict between the reciprocal rights of carriers, and the public, the carrier's rights must yield to those of the public, as the public good is held to be paramount, and is based upon the theory of the greatest good to the greatest number. 18. All charges must be reasonable, regardless of the returns fo the carrier. They may not be unreasonably high, in the light of other pertinent circumstances, merely in order to insure the carrier a high rate of return. 19. The Courts have defined a reasonable rate as one which is just to shippers and carriers alike. The Courts have said that if a rate is not compensatory to a carrier, it is unjust, oppressive and unlawful. 20. Determining the reasonableness of rates is both legislative and judicial in aspect. 21. The reasonableness of the interstate rate is determined by the Interstate Commerce Commission. 22. Ordinarily the reasonableness of intra-state rates is determined by state legislature or by bodies created under

authority of the State legislature. 23. State legislatures or commissions may not prescribe rates for Interstate Commerce. 24. The decisions of all Commissions whether State or interstate are subject to review by the Courts, when such decisions are violative of constitutional rights.

In addition to the foregoing the Courts have in their various decisions established recognized requirements for determining the reasonableness of rates. Some of these are as follows: All parties directly and materially affected must be considered. All facts and circumstances having a bearing on the rates must be considered, by such processes of reasoning as may be afforded by law, experience and with regard to the principles of right and justice. The public welfare rather than that of the individual, must always be the absolute determining factor. In determiinng the reasonableness of rates, the Courts must be guided by the effect upon the rates of all of the carriers involved, not merely the effect upon one carrier. The imposition of different rates for proprietary freight and freight independently owned does not become justified by the fact that the same ownership controls the freight offered and the stock of the railroad company transporting it. Certain factors which are not regarded by the Courts in determining reasonableness of rates are: A—the protection of the shipper from legitimate domestic or foreign competition. B—a shipper's demand for unlimited markets. C—a shipper's demands for equitable estoppels, that is, that carriers be restrained from changing rates because of shipper's expectations, even though justifiable, that low rates of perhaps long standing would be indefinitely maintained. D—carrier's demand for rates based upon what the traffic will bear, irrespective of other conditions.

Since the enactment of the transportation act, especially Section 15-A, and the consequent influence of this section upon the general rate level, the question of railway valuation is very important with regard to freight rates. Court decisions which affect the relationship of railway valuations to rates are entitled to careful consideration. Some important facts incident to this phase of rate making which have been gleaned from court decisions, follow. A carrier is entitled to a fair return on its investment. The measure of the investment must be determined by the valuation of that part of the carrier's property devoted to transportation. In a rate investigation such valuation must be determined by the Interstate Commerce Commission as of the time when the rate investigation takes place. Actual values and capitalization must obtain rather than exaggerated, inflated or fictitious values. Exaggerated values cannot be made the basis for excessive rates. The determination of correct railway values has never been based upon any specific formula, but must be based upon reason and consideration of all relevant facts. In fixing valuations the following elements may be considered, market value of outstanding securities, cost of construction, reproduction cost, location, good will and established business, value of franchise, return of value for purposes of taxation, and deterioration of plant. These elements are not in and of themselves conclusive, but in that they do have a bearing on the ascertainment of correct values, they are entitled to consideration. It should be remembered that the assets and the property of the carriers not used in the transportation business are not entitled to be considered in fixing a valuation as a basis for rate making.

Certain other factors which the Courts have held may properly receive consideration in the determination of the reasonableness of rates are: 1. Value of the service to the public. 2. The carrier's earnings. 3. Cost of the carrier's plant and the deterioration thereof. 4. Cost of transportation to the carrier, including carrier's fixed charges and operating expenses. 5. Mileage. 6. Volume and density of traffic. 7. Competition. 8. Rate comparisons. 9. Character and value of commodity. 10. Direction of movement. 11. Whether local or through traffic. 12. The effect of rates on the growth of the territory served. 13. Long and short haul clause of the fourth section of the amended act. 14. Seasonal conditions.

These several factors have been treated in detail in preceding chapters, but inasmuch as they have been recognized by the Courts as determinants of reasonableness, they are entitled to mention under the head of legal factors. They will be treated in the next and last article of this series.

Mid-Winter Season at Pittsburgh

Advance Call for Production Quite Favorable and Prospects for Next Few Months Very Good.

By Our Pittsburgh Correspondent

LEADING PRODUCERS in the sand and gravel industry at Pittsburgh, Pa., continue active and are making the most of the good weather for this season of the year which has prevailed up to the present time. Diggers in the different pools are being worked to capacity from day to day, while numerous barges of material are being towed to the local port. An encouraging feature of the situation is the advancing call for production, and the outlook is distinctly favorable for many prosperous months ahead.

That 1925 is destined to be one of the banner years in the local industry is rather forecast by the keenness of the sand and gravel companies to develop greatest efficiency of river fleets, and to add vessels where a deficiency is found. As a consequence, the shipyards in this vicinity are particularly active now, with several reporting bookings head to insure full production well through the winter. Among these are the Dravo Contracting Co., at its Neville Island plant, which is doing considerable work for the sand and gravel interests not only in the Pittsburgh port, but for those located in West Virginia and Ohio, as well. The Jones & Laughlin Steel Co., has also booked several orders for all-steel barges for the sand and gravel trade.

The price situation shows no pronounced change, and producers are supplying on a basis which has prevailed for some time past. Good river sand continues around $1.25 per ton at yard hoists to contractors, with a discount of 10 per cent from this level for dealers; for stock loaded on trucks the rate is $1.40 a ton, with like discount of 10 per cent, as in the previous instance. Barge deliveries range on a basis of $1.00 a ton at the diggers, with an increase of 10 cents per ton per pool.

Best river gravel is selling on a schedule of 85 to 90 cents per ton at company hoists, less 10 per cent discount to dealers, while loaded stock is priced at $1.10 a ton, like discount. For barge deliveries, the figures range from 65 and 75 cents upwards, at the diggers, with 10 cents additional per pool.

Crushed stone in the wholesale market at Pittsburgh holds to a $2.85 per cubic yard basis, both 1½ and ¾-in. Stocks, cargo shipments. The supply yards are asking around $4.00 for delivered material. The demand is fair at the present time. In connection with Portland cement, the wholesale rate continues at $2.19 per barrel, without bags, carload lots. The call is firm and there is marked stability to quotations, whether wholesale or retail, the latter figure ranging around $3.00, delivered on the job. The mill base at the plant of the Universal Portland Cement Co., Universal, near Pittsburgh, maintains at $1.95 a barrel to dealers and contractors, without bags.

Pittsburgh Federal engineers have recently been active in dredging operations in the vicinity of the Emsworth dam, Ohio River, where United States dredge No. 1 has been removing gravel deposits to permit a freer flow of water. Gravel dredging is also slated on the right bank of former Lock No. 2, Ohio River, with the same dredge.

The Keystone Sand & Supply Co. is maintaining heavy operations with its different diggers and river fleet, and a large tonnage of sand and gravel is being towed to the local port, a portion of the present output finding its way into the reserve. The company has been having a new digger constructed at the plant of the Dravo Contracting Co., Neville Island, with thoroughly modern machinery, designed to dig to a depth of 50 ft. below pool level. A. W. Dann, vice-president and treasurer of the company, has been absent from the city on his annual hunting trip, and is expected to return in the near future. He has been accompanied on the expedition by V. B. Edwards of the Dravo Contracting Co.

J. K. Davison & Brothers are running their usual river fleet for this time of year, and are enjoying a good demand for sand and gravel; diggers of the company are active. Work will soon be in progress on six new steel barges for the company for use in the sand and gravel trade, to be built by the American Bridge Co.

Vermont Corporation Operating Yellow Tone Marble Deposit

Brandon Rock Products Corporation Producing at Brandon. Modern Plant Preparing Stucco Dash, Terrazo and Roofing

THE discovery of an almost unlimited deposit of yellow tone marble at Brandon, Vermont, is of special interest to the building trade, as the material is in great demand both for inside finish, and for stucco dash and terrazo. The deposit at Brandon is owned by the Brandon Rock Products Corporation.

There are two hills of marble extending north and south and rising some fifty feet above the immediately surrounding ground. The company has opened a quarry on the east hill or ridge and has installed an up-to-date plant for the preparation of stucco dash and terrazo material for the market. This east ledge has been regarded as a "shattered" ledge, but as the workings are extended it appears to tighten and it is quite probable that dimension marble may be recovered from this ledge as well as from the western ledge.

At present, however, operations are being confined to the production of stucco dash, terrazo and roofing. Strata of different colored marble are being uncovered and the company now has, in addition to the yellow tone, substantial quantities of pink, green, and blue background. The big demand is for the yellow tone and the company can supply an average of a hundred tons a day of that color. And it is estimated that the east ridge alone will yield that amount for at least thirty years and that thereafter the workings can be extended downward indefinitely. It is proposed to core drill the west ridge before any blasting is done there, and there is every reason to believe that a large deposit of marketable yellow tone will be proven.

The operating equipment consists of an industrial railroad with scoop cars to bring the rock to the first crusher. Five Ingersoll-Rand jackhammers driven by compressed air are doing the drilling. A Sturtevant jaw crusher receives the rock from the quarry in sizes easily handled by one man. From the jaw crusher the rock is delivered by a Robins belt conveyor to a Kennedy Ball Bearing Gearless crusher. From this secondary crusher the rock is taken by a Kennedy continuous bucket elevator, 48 feet on centers, to a set of Kennedy pulsating four deck screens. These screens are located in the fourth story of the mill directly above the bins.

A carrying tube system conveys the oversize from the screens to Sturtevant rolls which reduce it and deliver it to the bucket elevator to be returned to the screens. The carrying tube system also delivers each size of the finished product from the screens to its proper bin for bagging. The bins are four in number and are located directly under the screens. Each of the four bins has a capacity of 30 tons, or one car load. The bagging and shipping room is on the first floor under the bins. The product is shipped in 100 pound bags of burlap. The compressor building located just

A View of the Quarry

Mill Showing Shipping Room.

The Mill and Compressor House.

north of the mill houses the Clayton air compressor and receiver.

Electric power supplied by the Hortonia Power Company is metered to the company's private line. The equipment is General Electric with separate motors and individual drive.

The stucco and terrazo sizes comprise the bulk of the company's present production. The dust is desirable for use as agricultural lime and has been approved by the New York State Experimental Station at Geneva, N. Y. Tonnage in excess of the capacity of the present plant is demanded by orders already received and plans are under way to increase the output.

The officers of the Brandon Rock Products Corporation are:

President—Wm. Rockwell, Brandon, Vermont.

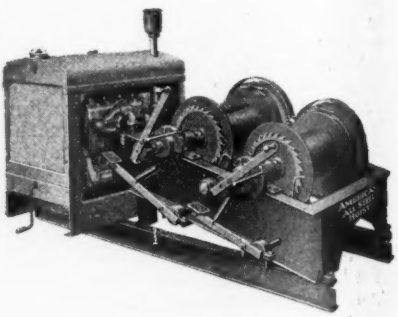
Vice-President—E. C. Rockwell, New York City.

Secy. and Treasurer—E. A. Bellmore, Brandon, Vermont.

General Counsel—Frank W. Williams, Brandon, Vermont.

A New Hoist

THE American Manufacturing and Engineering Company, manufacturers of cableways and hoists have come out with a new hoist designed and built especially for cableway excavators and drag scrapers. The most outstanding phase of this hoist is the two speed feature and the material used in the construction. As far as we know this is the only hoist on the market built entirely of steel. By the use of steel instead of the ordinary grey iron the manufacturer claims to have greatly increased the margin of safety and at the same time decreased the weight so that the hoist is more easily moved about. The two speed feature of this hoist makes it especially adapted for slackline and drag scraper work.



The New American Hoist.

The hoist is well designed and constructed. It is carefully machined. All gears are cut. The clutches are of the double cone design, operated by screw thrust. The front drum has a ball thrust bearing to make this drum overhaul easily. The hoist is lubricated by the Alemite system. Main shafts are drilled hollow so that the main drum bearings can be lubricated without getting grease to the clutches.

The engines used are four cyclinder gasoline industrial power plants ranging from 35 H. P. to 100 H. P. Drive from engine is silent chain drive for standard equipment.

Exhibitors at Crushed Stone Convention

THE following data is the latest available on the directory of manufacturers of equipment occupying booths at the National Crushed Stone Convention at Cincinnati, January 12, 13, 14 and 15th.

Allis-Chalmers Manufacturing Company—Booth 37

Photographic exhibit of crushing machinery and installations together with cement making, mining, pumping and power equipment. The company will be represented by W. E. Keine, B. McGrew, J. W. Johnson, C. J. Ratterman, W. G. May, J. R. Criswell, J. S. Bond.

American Hoist and Derrick Company—Booth WB-11

Machinery exhibit and photographic display of installations. The company will be represented by Mr. J. J. Cox.

American Manganese Steel Company—Booth 36

Exhibit of complete line of Amsco trench machine parts, consisting of buckets, plows, sprockets, chain, track shoes, etc.; and also specimens of the Missabe dipper, Clark reversible tooth, Amsco dredge pumps, etc. The company will be represented by A. W. Daniels and Bradley S. Carr.

Armstrong Manufacturing Company—Booth 25

Machinery exhibit showing a model all steel blast hole drill, together with a model Armstrong drill bit dressing machine. The Company will be represented by George R. Watson.

Atlas Powder Company—Booth 26

Exhibit of a general line of explosives. The company will be represented by C. E. Clifford and A. A. Mellin.

Austin Manufacturing Company—Booth 24

Exhibit of general Austin line of machinery. The company will be represented by H. Barrows.

Austin-Western Road Machinery Company—Booth 26

Exhibit of general Austin-Western line of machinery. The company will be represented by W. Cornwell.

Earle C. Bacon, Inc.—Booth 1

Exhibit of a working model of new pattern style "D" Farrel crusher. The company will be represented by William R. Young.

Bucyrus Company—Booth 39

Exhibit of large framed photographs.

Columbus-McKinnon Chain Company—Booth 49

Exhibit of chains of various kinds particularly steam shovel hoisting chain. The company will be represented by D. S. Brisbin and O. H. Hager.

E. I. DuPont De Nemours and Company—Booth 6

Exhibit of wall cabinets showing dummy cartridges of dynamite and samples of blasting powder and also various blasting accessories. The company will be represented by S. R. Russell and possibly J. C. Ahl.

Fate-Root-Heath Company—Booth 12

Exhibit of a Plymouth 8 ton and new Plymouth 18 ton gasoline locomotive. The company will be represented by H. R. Sykes, R. N. Lowry, George T. Wallace, F. B. Carter, Harry C. Collins.

Flexible Steel Lacing Company—Booth 49

Exhibit of alligator steel belt lacing, Flexco H. D. belt fasteners, and Flexco and Flexco-Lok expanded steel guards. The company will be represented by James S. Fitzgerald and William J. Young.

Haiss Manufacturing Company, Inc.—Booth 42

Exhibit will display photographs and literature illustrating the Haiss loaders. The company will be represented by the Geo. B. Curd Equipment Company of Cincinnati.

Hendrick Manufacturing Company—Booth 1

Exhibit of perforated metal screens, elevator buckets, and area grating. The company will be represented by B. G. Shotton.

Hercules Powder Company—Booths 50 and 51

Exhibit of Hercules explosives and blasting supplies. The company will be represented by C. C. Gerow and N. S. Greensfelder.

Inland Engineering Company—Booth 5

Exhibit will consist of photographs and literature on traction device and also crusher and pulverizer parts. The company will be represented by E. A. Lerner.

Jeffrey Manufacturing Company—Booth 8

Exhibit will be limited to models, parts and photographs of elevating and conveying machinery applicable

to the crushed stone industry. The company will be represented by J. T. Fowler and others.

Koehring Company—Booth 47 and 48
Exhibit of photographs and literature. The company will be represented by George J. Dimond.

Loomis Machine Company—Booth 10
Exhibit of a small line of machinery manufactured in long years past showing to some extent the development of drilling machinery from the crude early types; also drilling tools and photographs of machinery. The company will be represented by J. Reynard and C. C. Hale.

Manganese Steel Forge Company—Booth 12
Exhibit will display Rolman Double Lock Mesh Screens and Flat Link Chain, Pins, Bushings, Forgings, etc. The company will have several representatives in attendance at the booth.

Marion Steam Shovel Company—Booths 2 and 3
Exhibit not arranged as yet.

Morgan Engineering Company—Booth 1
Exhibit of a model Weston crusher with literature on other machines. The company will be represented by A. T. Davis.

Osgood Company—Booths 33 and 34
Photographic exhibit and literature. The company will be represented by Earl C. Smith.

Pawling and Harnischfeger Company—Booth 27
Motion pictures and literature. The company will be represented by A. J. Dreyer.

Quaker City Rubber Company—Booth 4
Exhibit of rubber belting for power transmission and conveying and elevating of materials and hose for all purposes, rod and sheet packings. The company will be represented by W. Trunnel.

Robins Conveying Belt Company—Booth 19 and 20
Exhibit of three different types of troughing idlers and also showing models of Perfex screen and Cataract rock grizzly. The company will be represented by T. Robins, Jr., and Mr. Lambert.

Sanderson-Cyclone Drill Company—Booth 42
Exhibit of a quarter scale model of one of their number 14 electric blast hole drills together with photographs and rock specimens. The company will be represented by W. B. Garber, J. L. Rose or A. O. Crum.

Smith Engineering Works—Booths 44 and 45
Exhibit of model crushing plant. The company will be represented by S. A. MacIntosh, who will be in charge of the exhibit and representatives from Columbus, Ohio, Louisville, Ky., and Indianapolis, Ind.

Taylor-Wharton Iron & Steel Company—Booth 31
Exhibit of some small representative Tisco manganese steel castings and booklets for distribution. The company will be represented by H. F. McDermott, Redington Moore, John Hock and C. B. Andrews.

G. H. Williams Company—Booth W2
Exhibit will consist of models of various types of clam shell buckets and a small working model of a derrick and bucket electrically operated. The company will be represented by E. L. Harrington, C. D. Buoy, T. D. Harter, and G. E. Monroe.

Williams Patent Crusher and Pulverizer Company—Booth 8
Exhibit of an operating model of the Williams Mammoth crusher and automatic feeder. The company will be represented by A. E. Schneider.

Note: In addition to the above there will be other manufacturers occupying booths at the convention. The data on these concerns was not available at the time of going to press. The exhibitiion space is adjacent to the convention hall at the Hotel Gibson.

Cambridge Sand & Gravel Co., of Boston, Mass., was recently incorporated for $500,000 and 5,000 shares without par value, by A. Muriel Rider of Danvers, Max L. Sand of Boston, and G. Duthie-Strachan of Chestnut Hill.

The Hamburg Ridge Lime Co., Inc., 10 West Blackwell St., Dover, New Jersey, was recently incorporated for $100,000 to mine limestone.

Yosemite Portland Cement Corp., Dover, New Jersey, has been incorporated for $1,750,000, to manufacture and deal in Portland Cement.

Waukesha Motor Company Developments

As the result of a demand from their various customers for a line of motors larger than heretofore produced, the Waukesha Motor Company is developing several new models. The first of these to be put into production is known as Model "CU"—bore 5⅜ and stroke 6¼ in. The power peaks at 1,500 R.P.M. at which speed it develops 70 H.P. The maximum torque of 350 foot pounds is obtained at a relatively low speed of between 500 and 700 R.P.M. which makes the new motor particularly adaptable to heavy duty service. L head cylinder blocks are used cast in pairs with removable cylinder head. Water is circulated by a centrifugal pump. The cool water enters at the lower part of the water jacket opposite the valves and is forced through large cooling areas completely around the cylinders and leaves the motor directly above the valves. Large cooling pockets are provided entirely around the valves to insure thorough cooling.

As in all of their motors, this Waukesha model is equipped with the design of cylinder head known as Ricardo type, which produces gratifying results in power and economy through the turbulence present at the moment of firing.

Lubrication is of the pressure feed type by a geared oil pump which is provided with a baffle plate outside of a large portion of the pump screen thus insuring oil suction, even should the lower portion of the pump screen become clogged with sediment. The oil is forced from the pump through copper tubing directly to each of the three main bearings and from the main bearings through drilled crankshaft to the connecting rod bearings.

Overflow from the connecting rod bearings oils the cylinder walls by centrifugal splash. Part of the overflow from the front main bearing is led to a cup into which the crankshaft gear dips thus providing lubrication for all of the gears. The geared oil pump is easily removable without necessity of removing the oil pan and an adjustable oil relief valve is used for regulation of oil pressure. All bearings are of ample size as judged from a sound and conservative engineering standpoint.

The pistons are of high grade grey iron and are accurately ground and carefully fitted to the cylinder bores. They contain three rings all of which are carried above the piston pin. The piston pin is held securely in the connecting rod moving in bronze bushings which are pressed into the pistons. Each connecting rod contains four bolts and the bearings are each secured by four lock screws. The hole in each connecting rod into which the bearings fits is accurately ground to fit the back of the bearing. An ordinary reamed hole for this purpose is not considered satisfactory since a ground hole can be made more perfectly round. The result of this operation is longer life for the connecting rod bearings.

The crankcase is cast separately from the cylinders and is of aluminum alloy. To give greatest possible rigidity a substantial section hangs below the center of the crankshaft. Large holes are provided in the side of the crankcase for inspection and adjustment.

The governor is of a type that has been so successful on past Waukesha models. It is of the patented Waukesha type built into the motor, is self oiling, positive in operation and non-hunting.

The motor can also be supplied in the form of a power unit to meet the many needs for portable power. This includes the motor mounted in a substantial frame and covered with a heavy sheet iron housing, radiator, gasoline tank, magneto, carburetor, vacuum tank, air cleaner, and Waukesha power take-off with clutch. Its construction is such that it will give uninterrupted outdoor service even in a driving rain.

An Invitation

Thomas Elevator Company of 20 South Hoyne Avenue, Chicago, invites all sand, gravel and stone producers to visit its plant in Chicago during the Road Show week. They will have several sizes of steam and electric hoists, both single and two-speed types, on their assembly floor ready to run.

Regardless of whether you own a Thomas Hoist or not, or whether you are interested in installing a new hoist at the present time, you should visit their plant this year as it would prove very instructive to you.

The A. R. B. A. Convention Program

THE complete program of the Annual Convention of the American Road Builders' Association to be held in Chicago, January 6, 7 and 8, has just been announced by Professor T. R. Agge, Chairman of the Program Committee. All sessions of the Convention will be held in the Elizabethan Room of the Congress Hotel.

Five sessions of the Convention will be held during the three days. Except on Tuesday, January 6th, when there will be only one session, there will be both morning and afternoon meetings. The Convention sessions will be open to all who desire to attend.

Those who attend all of the sessions of the Convention will have ample opportunity to visit the Show in the Coliseum as it will open on January 5th and will continue through January 9th.

The complete program for the Convention follows:

January 6th

Morning Session at 10:30 A. M., President Cranford presiding.

1. Opening Address by President Cranford.
2. "Building a System of National Roads Through Federal Aid." Thos. H. MacDonald, Chief of Bureau of Public Roads.

Afternoon Session, at 2:30 P. M., Geo. W. Tillson presiding.

3. "Impressions of English Highway Practice." Austin B. Fletcher, Consulting Engineer, Bureau of Public Roads.
4. "Are State Highway Programs on a Sound Financial Basis?" H. R. Trumbower, Economist, Bureau of Public Roads.
5. "Legal Aspects of Trunk Line Roads Through Cities and Villages." Samuel K. Markman, Chicago, Illinois.
6. "Suggested Revisions in Brick Paving Practice." W. D. P. Warren, Consulting Engineer, Decatur, Ill.

January 7th

Morning Session at 9:30 A. M., Paul D. Sargent presiding.

7. "Relation of Traffic Surveys to Highway Programs." William H. Connell, Engineering Executive and Deputy Secretary of Highways, State of Pennsylvania.
8. "The Evolution of Highway Traffic." Arthur H. Blanchard, Professor of Highway Engineering and Highway Transport, University of Michigan.
9. "The Super-Highway Plans of Wayne County, Michigan." Edward N. Hines, Chairman, Board of Highway Commissioners, Wayne County, Michigan.

Afternoon Session at 2:30 P. M., Frank Page presiding.

10. "Planning a Greater Chicago." E. S. Taylor, Manager, Chicago Plan Commission.
11. "Problems of State-Wide Highway Maintenance." Frank T. Sheets, Chief Highway Engineer, Division of Highways of the State of Illinois.
12. "Utilizing the Salvage Value of Old Roadway Surfaces." A. H. Hinkle, Maintenance Engineer, Indiana Highway Department.

Election of officers.

January 8th

Morning Session at 9:30 A. M., T. J. Wasser presiding.

13. "Determination of Stability of Asphalt Paving Mixtures." Prevost Hubbard, Chemical Engineer, The Asphalt Association, New York.
14. "The Contribution of Research to Highway Progress." Frank Page, Chairman of North Carolina Highway Commission.
15. "Dust Elimination on Gravel Roads." B. C. Tiney, Maintenance Engineer, Michigan Highway Department.
16. "The Final Link in the Lincoln Highway in New Jersey." Harry D. Robbins, Division Engineer, New Jersey Highway Department.

January 8th

Afternoon Session at 2:30 P. M., A. H. Blanchard presiding.

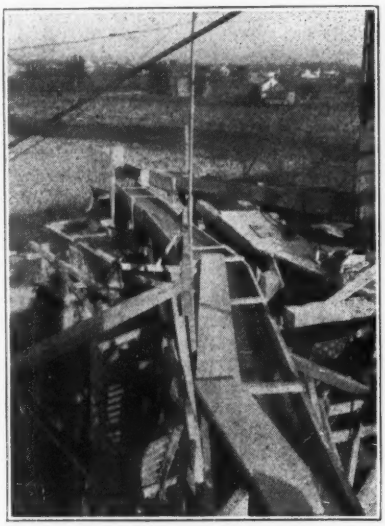
17. "Form Setting and its Relation to Riding Qualities of Concrete Pavements." C. N. Conner, State Construction Engineer, Raleigh, North Carolina.
18. "Investigations of Smoothness of Pavements." H. F. Clemmer, Engineer of Tests, Division of Highways, Springfield, Illinois.
19. "The Evolution of Construction and Maintenance Equipment." O. L. Kipp, Construction Engineer, Minnesota Highway Department.

The Eaton Kaster Gravel Company Modernize Plant

Modern Stockline Cableway Plant at Indianapolis, Ind. Delays and Wasteful Handling of Material Reduced

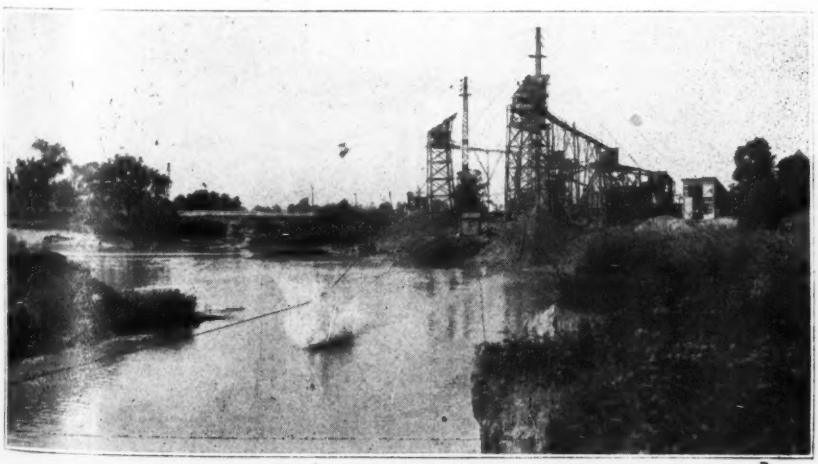
ONE of the busiest gravel plants in the State of Indiana is the Eaton-Kaster Gravel Company of Indianapolis. They have had a very busy season and are producing an enormous amount of gravel. Their plant has been in constant operation throughout the season and they have sometimes worked as long as 16 to 20 hours per day. They have made a very fine record and have had practically no delays.

After doing the best they could in a small way the Eaton-Kaster Gravel Company decided to modernize their plant and equip it for large production. In laying out the new plant special care was taken to guard against delays and unnecessary handling of material.

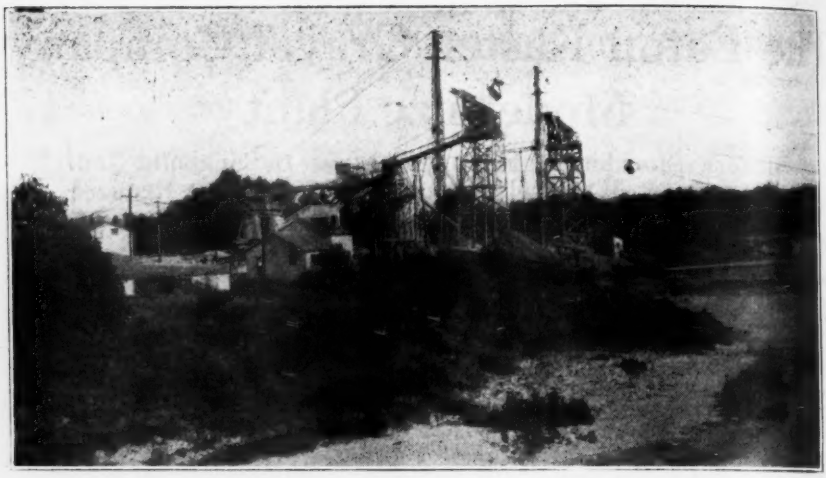


Flume to Settling Tanks

Two Pioneer slack line plants were installed with 90 feet steel masts and 800 feet spans. The power is furnished by two Thomas electric special two-speed hoists, with 100 H. P. motors. Each bucket operates independently of the other, delivering to separate grizzlies. Here stones over 2½ inches are thrown out and, water being supplied from a 5 inch centrifugal electrically driven pump, the rest of the material is carried in solution to sluice boxes over the bins. Striking the gravel screen of ¼ inch mesh at about 90°, the sand and water is carried through to the settling



View Showing the Two Masts

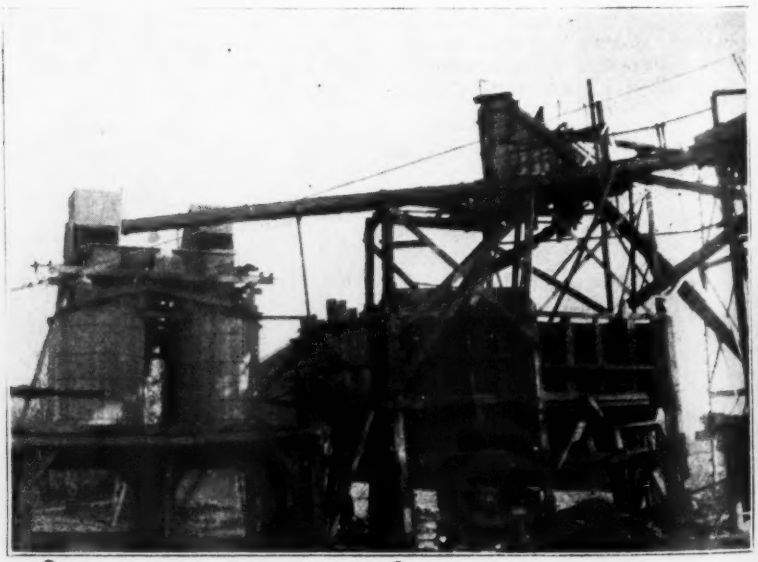


General View of Eaton Kaster Plant

tanks, while the gravel falls into a gravel bin.

As a large surplus of sand is encountered the settling tanks are adjusted to furnish the desired grade of sand and the surplus is carried off in a long flume with the waste water. At this point arrangement is made to divert a certain amount of sand to a concrete block plant. Large wooden circular tanks bound with steel hoops are used for bins and the material is delivered by gravity to trucks as required.

A special feature is that although each plant is operated separately by a special arrangement of chutes, gravel from either grizzly may be diverted over either set of screens into whatever bin is desired. This insures a uniform supply. By the use of electric power throughout boilers and firemen are not required, and sufficient power is always at hand when needed.



A General View of Loading Facilities

To guard against a shortage of trucks, a special contract was entered into whereby there are always sufficient number of trucks on hand to deliver the gravel as fast as it is prepared. By a system of duplicate tickets an accurate check is kept by the bookkeeper on every load of gravel delivered.

In some cases, rotary screening is necessary, but the plant has obtained very good results with a system of gravity screens and an abundance of water. After the gravel is once elevated to the grizzly screen, no more power is required, the gravel flowing by gravity to screens, bins and finally loaded into trucks. No additional power and no machinery to get out of order and cause trouble.

Indianapolis has enjoyed a great deal of building work during this season, which accounts for the large demands made upon Easton-Kaster Gravel Company to furnish material. Their plant is a truck loading plant and is conveniently located so that they have been able to get a large percentage of the business. Due to the large demands of the local trade, they have had to work hard in order to supply the demand. The plant is located on Eagle Creek and Morris Street, Indianapolis. Mr. A. E. Eaton is president and Mr. R. C. Kaster is secretary and treasurer.

View of Grizzley

CEMENT PEOPLE TAKE A REST

This Is the Season When Producers Slow Down and Make Repairs, in Preparation for New Year.

By Our Special Correspondent

PROSPECTS CONTINUE bright in the Lehigh Valley cement district of Pennsyvania, and while the winter season is bringing a slight lull in shipments of material, this is still barely noticeable at the different mills as the demand for stocks for storage maintains at a high point. The current year closes as a banner one in this section, and the outlook for 1925 is equally auspicious; every indication points to advancing orders and continuous production under the most favorable circumstances.

There is a growing call for cement from the farming districts, now all the more pronounced, with a slight decline in demand for immediate material from the construction industry, and the business to be secured from this quarter is sure to be an important factor during the spring months ahead. Moreover, road construction is giving indications of making a heavy draft on supplies shortly after the turn of the year, and contracting interests are now securing figures for anticipated work. The general trend bids fair to make necessary mill expansion in the very near future, covering both buildings and additional machinery.

Shipments during November were maintained at peak, and every day saw its quota of cement leaving the mills. The high figures of the previous months were duplicated during the period. With a touch of cold weather early in December the bulk shipments were quite a little lessened, particularly in the Coplay section, but with plants holding to a full production schedule primarily for storage purposes. In consequence, several plants have been enabled to create a little reserve.

As this is the time of year that mills turn to repairs and necessary machinery replacements, the next month is likely to show a few of the plants curtailed for this purpose. The Giant Portland Cement Co., has already closed its Reliance mill at Egypt, and is now busy with a repair program. It is stated that the plant will be placed on the active list at an early date.

The labor situation continues satisfactory and there is no change worth recording. The supply of men is ample for all immediate demands, and more men on call during recent months than necessary, have made possible the picking of the best kind of help for regular employment. There is still a call for help in certain quarters in the bagging departments, and there is scarcely a mill which is not running at peak in this line, several continuing on an overtime schedule. Wage scales still hold uniform.

The Atlas Portland Cement Co., is maintaining full production at its large plant at Northampton, easily one of the heaviest producers in the district, and the plant expects to continue on the active list indefinitely. The company is securing an expanding market for its new cement recently developed at the mill, and it is likely that there will be noticeable increase in the manufacture of this material as the months advance. The cement sets and hardens with 24 hours, and is being used extensively for machinery foundations and other lines where time is an important consideration. The regular Atlas brand is also in good demand and incoming orders are said to be satisfactory.

The Bath Portland Cement Co., Bath, Pa., has decided to proceed at once with the erection of its proposed new mill on property acquired some time ago at Sandt's Eddy, near Easton, Pa., and grading and other preliminary operations are now in progress. The plant will consist of a group of buildings, with power house, machine shop and other accessory structures, estimated to cost close to $1,500,000, with machinery. It has been designed to develop a production of approximately 7,500 barrels of material a month. The wet process will be used for manufacture, with machinery for the most part electrically-operated. The entire project will be carried out under the direction of the Public Service Production Co., Public Service Terminal, Newark, N. J., engineer and contractor, which has prepared the plans and will handle erection. Equipment purchases will also be made by the last noted interest. The company is maintaining active operations at its Bath mill, giving employment to a regular working force, and large shipments have been leaving the plant.

The Lawrence Portland Cement Co., continues active at its mill at Siegfried, Northampton County, and proposes to keep on a full basis for an indefinite term. The Lehigh Portland Cement Co., likewise, is busy at its different plants at West Coplay, Ormrod and Fogelsville, where regular working quotas are being employed; the company is booking substantial current and advance orders, insuring capacity operations for some time to come. At Nazareth, both the Nazareth Cement Co., and the Phoenix Portland Cement Co., are running full, with sizable shipments leaving the mills from day to day; the Dexter Portland Cement Co. is another active interest in this same section, and is giving employment to a regular working force under a capacity production schedule. The Coplay Cement Mfg. Co., is running under a normal manufacturing basis at its Coplay mill. The Giant Portland Cement Co., while curtailing temporarily at its Egypt plant, will soon again be on the active list; the company has declared its regular semi-annual dividend of 3½ per cent on the preferred stock, and another 7 per cent on account of the accumulated dividends on the preferred stock.

The Boyne City Portland Cement Co., Boyne City, Mich., is being organized with a capital of $2,000,000, to construct and operate a cement mill in this section. It is said that the company will proceed with plans for the project at an early date. W. H. White, Boyne City, has been elected president.

The Port Huron Cement Co., Port Huron, Mich., has awarded a general contract to the McDonald Engineering Co., 53 West Jackson Boulevard, Chicago, Ill., for the erection of new storage structures at its plant, reinforced-concrete, on which work will proceed at once. The contracting company also prepared plans for the structures.

The Phoenix Portland Cement Co., Jefferson County Bank Building, Birmingham, Ala., is to commence construction of a new mill on tract of about 15 acres of land on the Industrial Canal at New Orleans, La., recently acquired. The plant will consist of several one-story steel and reinforced-concrete units, with power house and machine shop, a portion of the plant to be given over to lime manufacture. The company purposes to use clam and oyster shells in the manufacture of cement, and has secured rights for material of this kind

Political Improvement Helps Situation

Various States Announce Their Road-Building Programs for 1925. How the Various Producers Stand Now.

By Our Eastern Correspondent.

THE YEAR 1925 looms as a big one in the sand, gravel, crushed stone and affiliated materials markets in the eastern part of the country, and the outlook is one of decided encouragement to the producers. The clearing up of the indefinite political and business situations of the late fall season has had much to do with the change in attitude. Orders are now apparently placed without any misgivings and advance account is shaping up in a way that will probably mean maximum capacity at the different pits and quarries as the spring season arrives.

With winter production of sand, gravel and crushed stone at close to a regular basis for this time of year, producers are giving thought to plant and equipment expansion and betterment for the encouraging business ahead. It is expected that a number of announcements in this connection will be made at an early date, and also that machinery orders will soon be placed in different quarters. Unquestionably, modern digging, conveying, loading and other machinery will be in active demand in the weeks ahead; it will be needed not only for increased outputs, but for lowering production costs wherever possible.

The building situation is holding up well in the eastern districts for this time of year, with corresponding call for sand and gravel materials. Actual contracts placed in the New York district during November reached about $77,100,000, an increase of about 5 per cent over the figures for October, and of 13 per cent over the same month of a year ago. Residential construction continues to be the feature of the present trend, and more than 50 per cent of the total work is recorded in this line. In this same period, Northern New Jersey registered contracts to an amount of about $32,000,000, with residential work, likewise, predominating. Advance operations, for which plans are now in preparation, show a gross total of more than $125,000,000.

In the building field, the labor situation is entirely satisfactory. The discussions are now towards present compensation laws and the proper training of apprentices, rather than the current topics, usually, of the supply of men and wage scales. The growing movement to develop skilled mechanics in different branches of construction was given impetus at the apprenticeship meeting at the New York Building Congress, held at the Hotel Commodore on December 10, where the matter was thoroughly discussed. Every encouragement and aid is to be given to the proper training of the young men by the leaders in the industry.

With the open winter season up to the present time and the marked tendency to proceed with building projects, there has been a substantial call for sand and gravel during the past month, with crushed stone, also, holding well in this direction. The price situation shows a steady and firm inclination to maintain at existing levels, and there is hardly a worth-while change to be noted in the levels of basic materials during this time. The demand for Portland cement is good, and there is a noticeable trend to build of concrete, rather than brick or other materials. Market supplies are sufficient for all immediate call, and the local depression in the common brick market has brought rather a heavy surplus of this commodity.

There has been no fluctuation in the price of building sand, and a level of $1.00 a cubic yard in wholesale quantities continues current. Dealers are quite active in point of call and are doing considerable stocking up in anticipation of the remaining winter months. The retail rate holds at $2.00 and slightly upwards for the material in cubic yard lots delivered on the job.

Best washed gravel, also, shows defined uniformity in the matter of price. A level of $2.00 a cubic yard in cargo shipments, both ¾-in. and 1½-in. stocks, prevails under a fair active call. There is a noticeable increase in inquiries for advance shipments. The recent advance of 25 cents a cubic yard, wholesale, is now reflected in an increase quotation at the building supply yards, which are asking $2.90 for delivered material, both sizes, as compared with a previous figure of $2.75. The new rate is expected to maintain through the winter.

Crushed stone shows no change from the $1.75 and $1.85 per cubic

yard levels, 1½-in. and ¾-in. material, respectively, and a medium rate of business for this season of the year is going forward in this line. In the retail market, a price of $3.00 per cubic yard continues current, both stock sizes, for delivery on the job within established zones. Producers are looking forward to an active call for the forthcoming 1925 road-building season. Different states are now formulating their programs, with announcements from New Jersey and Pennsylvania State Highway Departments that $11,000,000 and $50,000,000, approximately, will be expended in these states in the order noted. In New York the projected work will equal, if not exceed, the last noted sum.

Portland cement can well be said to be holding its own in the New York and neighboring material markets, and the active call for stock is shown by the heavy shipments from the mills reaching the different distributing centers. There is no change in prices, either at the mills or to the consumers. The figure at New York, alongside dock, holds at $2.15 per barrel, while delivered by truck the quotations are $2.50 to $2.60 a barrel, wholesale, cargo shipments, less bags. Supply dealers are furnishing the material at a rate of $3.00 a barrel, delivered on the job, customary bag rebate of 10 cents each. With the winter season now well advanced, it is expected that these levels will prevail for the remainder of the cold period. The Hudson, N. Y., producers are holding to a mill base of $2.05 a barrel, without bags, carload lots, to dealers and contractors, while the Lehigh Valley mills continue on a base of $1.95.

The New England building supply market reports a fair active call for important commodities, without any appreciable change in quotations. At Boston good washed gravel is being turned at the recently advanced rate of $1.50 a ton, wholesale quantities, both 1½-in. and ¾-in. sizes. Building sand is now $1.00 a ton in cargo shipments, and is maintaining well at this figure. Crushed stone shows no change from the late increased level of $1.60 a ton, wholesale, 1½ and ¾-in. stocks, and is in fair call. Portland cement has experienced a fractional decline of 3 cents a barrel in the Boston wholesale market, with the rate now standing at $2.67 instead of $2.70, without bags. Dealers are quoting at $3.48 a barrel in less than truck load lots, delivered on the job, with regular bag refund of 10 cents, while in truck load quantities, the price is $3.40, delivered. White Portland cement holds to a $2.00 a bag level, retail, while high alumina cement is priced at $2.40 a bag by the different supply yards at Boston and vicinity.

The Pittsfield Lime & Stone Co., 152 West 42nd Street, New York, N. Y., is having plans completed for extensions and improvements in its plant at Richmond, Mass., estimated to cost close to $200,000, with equipment. The new buildings will be of steel and concrete, and will replace the portion of the works destroyed by fire several months ago. Richard T. Meade & Co., 13 East Fayette Street, Baltimore, Md., are engineers for the project.

The Hampton Roads Sand & Gravel Corporation, Hampton Roads, Va., has filed a voluntary petition in bankruptcy, showing assets of $753,705, and liabilities of $629,047. C. C. Collmus, Jr., formerly of Baltimore, Md., is president.

A New Automatic Grease Cup

A GREASE CUP designed to feed semiliquid lubricants to motor car chassis parts at a constant rate has been put on the market by the National Automatic Grease Cup Co., 1603 S. Michigan Ave., Chicago. This cup, which is substantially made, does not replace other systems, merely adding to them a reservoir containing sufficient semi-fluid grease or heavy oil for two to three thousand miles of operation. The manufacturers state that the cup can be easily applied to any car equipped with a greasing system by simply removing the fitting, screwing the cup into place and putting the fitting on the cup, filling with the same grease gun. It is claimed that in addition to giving greatly increased mileage on one filling, the cup, combined with the use of semi-fluid grease, will eliminate chassis squeaks, water pump leaks through shaft bearing, and reduce repair and replacement expense on king pins and spring shackle bolts. A visible gauge shows the degree of fullness of the sup at all times. A valve is provided for regulating the flow of lubricant and it is claimed that after being adjusted to the requirements of the bearing it will work continuously and accurately.

Ship Early, Slogan for 1925

Secretary Barrows Reports Sand and Gravel Doings in 1924. Many Important Accomplishments Cited.

By Our Washington Correspondent

THE NATIONAL Sand and Gravel Association, through T. R. Barrows, executive secretary, has instituted a "ship early" campaign for 1925, and is calling on every member of the association for support. In closing his annual report for 1924, Mr. Barrows says:

"Ship Early campaigns should be instituted by every member, to supplement the general activities of the National Association in this respect. Cooperation in this matter from all sides is bound to be beneficial to everyone concerned."

Back of this campaign and the request of Mr. Barrows for support from every member, is information which Mr. Barrows has received that there will be a greatly increased demand for coal cars, due principally to the heavy demands for steel and consequent greater activity of the steel mills. He thinks the members of the association, with the demand that is in sight for sand and gravel products, should make every effort to speed up early shipments.

In this connection, Secretary Barrows says:

"The past year was one of acute depression in the coal industry, but with the steel industry, which consumes 20 per cent of the annual production of bituminous coal in a normal year, booked with orders which insure a steady output, it is a certainty that the coal industry will offer larger business to the carriers, especially during the summer and fall months."

In his annual report, Secretary Barrows reviews accomplishments of the association during the past year, among these being extending and promoting the use of properly prepared sand and gravel, including three important instances of effective opposition to use of wayside pit materials by Federal and State governments.

Extending the use of gravel in Federal-aid highway specifications.

Demonstrating the suitability of washed gravel as railroad ballast.

Representation of the sand and gravel industry before all departments of the Government, and development of working relations with other national organizations of the building industry.

Research work at the request of different agencies of the Government engaged in special work affecting the sand and gravel industry, such as the Plastering Conference of the Bureau of Standards, the Winter Construction Investigation of the Department of Commerce, the Uniform Building Code Committee of the Department of Commerce, the Federal Specifications Board, and others. Through the recommendations of the National Association to these bodies, the interests of the established and responsible producers of sand and gravel have been protected.

Modification of car demurrage rules to prevent coal mines from holding cars indefinitely and thus denying their use to the sand and gravel industry.

Successful opposition to proposal of uniform rate on sand of all grades, all purposes, which would have resulted in general increase in all rates on building sand.

More reasonable workmen's compensation insurance rates.

Incorporation of suitable sand specifications in city building codes.

Protecting interests of sand and gravel industry in the nation-wide distribution of open-top cars by the American Railway Association.

Opposition to proposal for general cancellation of Kelly's combination rule without protection of basis now employed by sand and gravel producers.

Securing minimum weight of 90 per cent of marked capacity of car on sand and gravel in cases where minimum was on basis of marked capacity.

Cleaning and repairing of cars furnished by the carriers.

Opposition to proposal for restriction of reconsignment rules on sand and gravel.

The car loadings of sand, gravel and stone during 1924, as revealed by the reports of the American Railway Association, have been the highest in the history of the industry. The total loading of sand, gravel and stone during September was 246,516 cars, which is the largest loading for any single month on record. October was second, with a total loading of 242,770 cars. A noteworthy fact is that loading of sand, gravel and stone during September and October has averaged over 60,000 cars weekly, a figure which has never been reached

prior to the beginning of this year. Prospects for the sand and gravel industry during 1925, taking the country as a whole, are excellent. Scientific research, vigorous and systematic promotional work, now possible as direct results of the continued growth of the National Association, are commended by Secretary Barrows as the principal activities of the organization for the year 1925.

According to figures compiled by the U. S. Geological Survey, the production of Portland cement in November was 13,141,000 barrels. This shows a seasonal decrease compared with October, but it is an increase of 538,000 barrels over the production for November, 1923. Shipments of Portland cement during November, 1924, totaled 10,289,000 barrels, a small increase over last November's figure. Stocks of Portland cement on hand at end of November totaled 8,927,000 barrels, approximately 2,000,000 barrels more than at the end of November, 1923.

The Department of Commerce announces that, according to the data collected at the biennial census of manufactures, 1923, the establishments engaged primarily in the manufacture of artificial stone products (not including paving or roofing), such as building blocks, building trimmings, etc., and other articles manufactured from a combination of stone, gravel, or sand, with cement, reported products valued at $53,602,321, an increase of 68.7 per cent as compared with $31,768,143 in 1921, the last preceding census year.

New Locomotive Crane

THE Brown Hoisting Machinery Company of Cleveland, Ohio, has just brought out a greatly improved model of their No. 4, 20-ton capacity locomotive crane. Users of previous models will be quick to note the many improvements that have been incorporated in this new model. The more noticeable changes are: the high boom hitch, the wide truck frame, the extra large diameter rotating ring and the contour of the cab. The latter presents a more pleasing appearance and it is of better construction.

The crab has been simplified by the elimination of one shaft, thereby making the remaining parts much more accessible. The drums are independently driven and free running with outside band clutches. The worm gear boom hoist runs in an oil bath and this, with the high boom hitch, makes booming with loads an easy operation.

An innovation in locomotive crane construction is the specially constructed wide truck frame with a center sill running the entire length, to which are fastened the friction-type draft gearings. In consequence of the wide truck-frame an extra large rotating ring is made possible which materially adds to the stability of the crane. The load rollers that support the revolving superstructure are larger and are removed from above without jacking up the superstructure. The vertical rotating shaft can also be removed from above.

The cumbersome and unsightly counterweight device for retrieving the tag line and electric cable in grab bucket and magnet work has been discarded and in its place an arrangement that is both compact and novel has been installed. The main hoist shaft drum and "niggerhead" the latter being keyed to the shaft. The small drum, upon which the tag line or electric cable is wound is rotatably mounted on the shaft and is driven by the niggerhead through a slip friction device.

The manufacturers, in announcing this model, state that all the excellent qualities of previous Brown hoists have been retained, but that the latest No. 4 is a better crane with higher daily output and greater capacities.

Telsmith Quarry Plants

Bulletin No. 267-A, entitled "Telsmith Quarry Plants," a catalog devoted to line drawings showing typical quarry plant layouts, has been issued by Smith Engineering Works, of Milwaukee, Wis. These plant layouts range in capacity from 10 to 325 yards an hour. Most of the drawings are recent, and many have never been published before.

This book of plant designs was compiled to assist prospective operators in selecting and arranging their equipment. These are not novel but standard types in common use.

An unusual feature of the book, likely to prove of benefit to quarry men, is the complete list of equipment required for the plant, which is furnished with each drawing. At the same time a free discussion of both the advantages and disadvantages of the particular layouts is included.

Outstanding 1924 Achievements of Link Belt Company

By C. S. HUNTINGTON.*

IN REVIEWING the installations of sand and gravel plants made during 1924, by the Link-Belt Company of Chicago, it impresses one that the majority of them have been made for concerns either directly engaged in the gravel producing business or who were closely allied with the industry. Only a very few newly organized companies have assumed the obligation of new plants and gone into the business. This, it seems to me, is a condition very beneficial to the average producer and indicated a healthy condition in the industry as a whole.

Among the modern plants erected and put into operation last year there are three which form outstanding examples of efficiency and practical methods. These three are: the J. F. Shiely Company of St. Paul; the Montgomery Gravel Company, Montgomery and the Sturm and Dillard Company, Syracuse, Indiana.

The Shiely St. Paul plant was designed and equipped by the Link-Belt Company of Chicago. The plant is unique in that it is built within the city limits and is surrounded by residences, a college, a park and a State Fair grounds. Ninety per cent of the product of this plant is shipped by trucks, which trucks are compelled to use the broad city street adjacent to the plant. Through the employment of a new Link-Belt drag scraper the sand and gravel is delivered dry enough to permit the constant stream of trucks to travel over the city street without doing damage to pavement and adjacent lawns.

The plant is designed to give continuous, uninterrupted production. This is brought about through the design which made the plant literally a number of units, each self-contained and without dependance upon the other. Thus one unit can be inoperative without effecting the remainder of the plant.

Electrical power is used throughout in the operation of the Montgomery Gravel Company. In addition to the washing screens, pumps and conveyors, both the shovel and locomotive are electrically driven. The deposit from which this plant draws its supply of raw material contains a large quantity of gravel but no oversize material requiring crushers.

For the most part, the Sturm and Dillard plant produces material for railroad ballast. This is a new and rapidly expanding field and a well washed and graded material is necessary to meet specifications. The plant was designed with this feature in mind but arrangements were also made for the production of material of commercial size. Concrete bins are used.

*Engineer, Link-Belt Company.

General View of the Montgomery Gravel Plant.

The Massillon Steam Shovel

The "MASSILLON" SHOVEL built by The Russell & Company of Massillon, Ohio, is of special interest to producers and others interested in this type of equipment.

Particular emphasis has been laid by Russell engineers on the points of design that make for strength, durability, power, and low digging costs. The power plant of the shovel is designed to give a pronounced surplus of power over the nominal rated load of the machine. The machinery arrangement is such that the operator has a maximum of deck room for his convenience and safety. At every point except the cab framing, structural steel has been eliminated and steel castings have been substituted. The boiler is of more ample capacity than those usually supplied in this class of equipment.

The crawler type machine is of very simple and rugged design. The links are heavy and the connecting pins of large diameter and are in four point shear; axles are so placed as to give the truck frame great stability and the proper distribution of weight upon the ground. The crawler bearings are high out of the dirt.

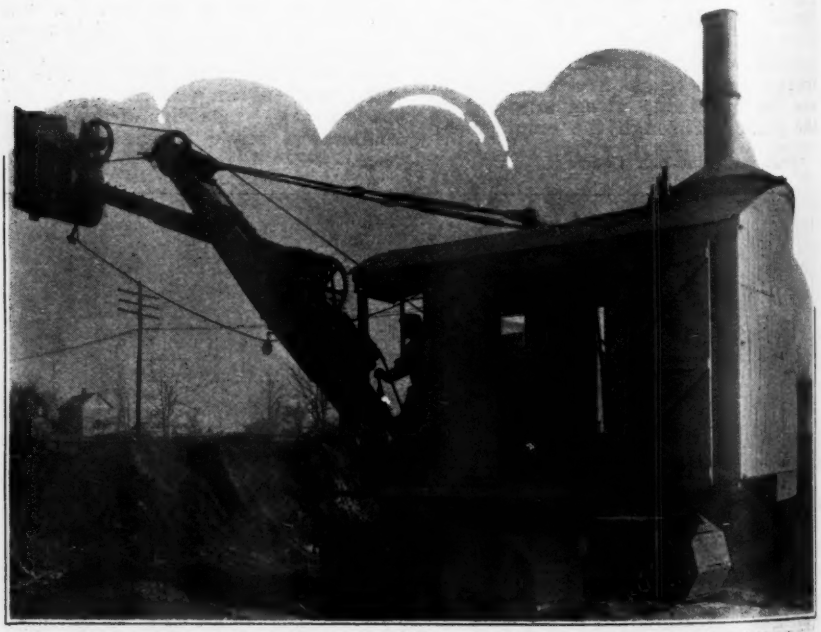
The Shovel is made to be used with drag line or clam shell equipment and is especially well adapted for crane service. It will be furnished with crawler, traction, or railroad traveling gear.

The Russell & Company, builders, have been engaged in manufacturing heavy steam and internal combustion engine units for many years, having been in business since 1842.

High Temperature Insulation

Last year the Celite Products Company of Chicago sent out a printed lecture on "Heat Transfer and High Temperature Insulation," which was given before the engineering students at approximately 50 of the large universities during 1923-24.

The lecture has been rewritten for 1924-25 under the title of "High Temperature Insulation." Much of the same data is being used, but the new edition contains more definite information on methods of determining heat flow through high temperature walls composed of various materials. This lecture has already been given at about 25 universities this year, and will be given at as many more in 1925.



The Massillon Steam Shovel

Mundy Exhibits Hoist

The J. S. Mundy Hoisting Engine Company of Newark, New Jersey, has just completed a miniature one-sixth of a horse power single drum electric hoist, for exhibition at the Annual Road Show to be held in Chicago, Ill., the week of January 5, 1925. A McKiernan-Terry miniature steam hammer will be operated by this small hoist.

This unit will drive and pull miniature piles, demonstrating the value of the steam hammer in construction work. The hoist is complete in every detail and operates the same as a regular electric hoist. It has a capacity of 100 pounds at 30 feet per minute, using three layers of ⅛ inch diameter wire rope. In size it is 15 inches long, 10 inches wide and 8 inches high. The one-sixth horse power is transmitted to the 3 inches diameter drums through two sets of gears meshing with steel pinions all with cut teeth. An asbestall non-burn friction 6 inches in diameter engages the drum with slight pressure on the 5 inch friction lever. The drum and load is held by a ½ inch square dog, engaging a 4 inch diameter ratchet on the drum. A miniature foot brake lined with heat resisting "Asbestolin" controls the hoist. The brake shaft is ⅛ inch in diameter, the drum shaft is ⅞ inch in diameter. The intermediate shaft is ¾ inch in diameter. The hoist is entirely lubricated by the Alemite system.

Green Scraper Catalog

L. P. Green is issuing a new catalog containing considerable data concerning the operation of scrapers and their varied uses. Several pages are devoted to illustrating installation. Some typical layouts are also included.

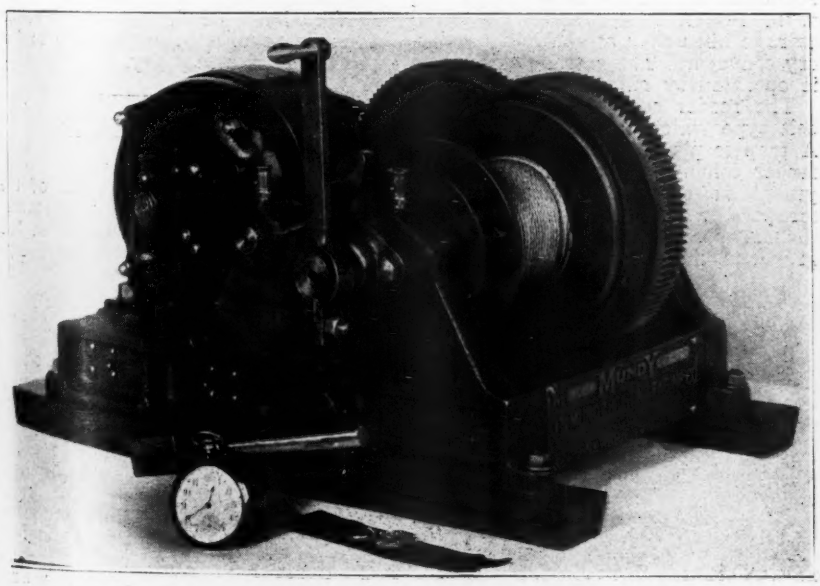
The new catalog is to be a 16 page book 8½x11 inches and will be sent to any producer upon request.

Sand Lime Convention

The next convention of the Sand Lime Brick Association which will be the 21st will be held at the King Edward Hotel, Toronto, February 3rd and 4th, 1925. The Canadians under the leadership of Mr. H. W. Terry, are preparing to make this an unusual convention.

Foote Item

Foote Brothers Gear and Machine Company has recently completed arrangements with the Thrall Electric Company of Havana, Cuba, for exclusive representation of IXL Gear Products and Speed Reducers in Cuba.



The Mundy Miniature Hoist.

The Russell Gravel Plant

HIGHWAY departments have long conducted experiments on gravel material for roads. The results of these experiments indicate conclusively that crushing the oversize gravel and mixing into the aggregate makes better road surfacing material than pit run with oversize eliminated.

In order to meet this requirement and the specifications already adopted by the various state highway departments the Russell Grader Manufacturing company has perfected a portable gravel plant which screens, crushes and loads all in one operation. All the material must pass the screen (even the material from the crusher must return to the screen) and therefore insures a very uniform product. It takes the material from the pit trap, crushes all oversize, screens all material and loads directly into trucks at a rate as high as a yard a minute.

Not only is the Russell plant economical to operate but it produces the right material for road gravel. All oversize from the pit run is crushed, thereby adding to the aggregate the irregular shaped material so necessary for a firm, well-bound road.

The Russell plant consists of the following units mounted on a four-wheel truck: feeder conveyor, a screen, reduction crusher with a bucket elevator return to the screen, a small storage bin under screen and a delivery conveyor. The entire combination is operated by only one power plant.

The feeder conveyor is an endless belt type which extends into the pit. A trap is placed over the end of the feeder conveyor to which the pit run gravel is conveyed by teams and scrapers or a dragline. A dragline is the cheapest method of bringing the gravel to the plant.

The gravel is then conveyed up to a shaker screen which has round hole perforations. The size of the perforations in the screen vary according to the state specifications. The most popular size is one-inch. All material passing the perforations falls into a hopper like bin below the screen. The oversize is fed into the crusher.

The jaw type reduction crusher used on this plant is capable of reducing all oversize to one-inch or smaller in one operation. When the material passes through the crusher it is returned to the screen by a bucket elevator. Any slabs not crushed fine enough must go back to the crusher. In this way all gravel must pass through the perforated screen before it is ready for the road.

The bin mounted underneath the screen has storage room enough to keep plant running to full capacity while trucks are coming and going. From the storage bin outlet there is a loading conveyor also of the endless belt type, to deliver the gravel to the trucks. The loading conveyor is equipped with a clutch so that it may be started or stopped without interfering with the operation of the rest of the plant.

The capacity of the Russell plant depends entirely upon the quantity of oversize material passing over the perforations and through the crusher. It is reasonable to expect 300 to 500 yards per working day.

The Rusell Gravel Plant

Link-Belt St. Louis Office Moves

The St. Louis branch office of the Link-Belt Company has recently moved from their old quarters at 705 Olive street to larger and more conveniently located offices at 3638 Olive street.

Personal contact is necessary in the discussion of engineering equipment such as Link-Belt products, and heretofore much time and energy were lost.